

no 46

A-B-F.  
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EXHIBITION

OF THE PRODUCTS OF ALL NATIONS

1876

AND THE WORKS OF  
MANUFACTURE

EXHIBITORS

ALL NATIONS

IN ORDER TO

SHOW THE PROGRESS OF

CIVILIZATION

AND THE ARTS OF

MANUFACTURE

AND THE ARTS OF

MANUFACTURE



~~A. 55. 1.~~

London: ExH., 1851.

AR-~~B~~-F.

Ex. 1851. 124



EXHIBITION  
OF THE  
WORKS OF INDUSTRY OF ALL NATIONS,  
1851.

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PROSPECTUSES  
OF  
EXHIBITORS.

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VOL. I.

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RAW MATERIALS.

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CLASS I.—MINING AND MINERAL PRODUCTS.

II.—CHEMICAL AND PHARMACEUTICAL PRODUCTS.

III.—SUBSTANCES USED AS FOOD.

IV.—VEGETABLE AND ANIMAL SUBSTANCES USED IN  
MANUFACTURES.

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COLLECTED UNDER THE AUTHORITY OF THE  
Royal Commissioners.



EXHIBITION  
OF THE  
WORKS OF INDUSTRY OF ALL NATIONS.  
1851.

PROSPECTUSES

EXHIBITORS.

RAW MATERIALS.

- CLASS I.—MINING AND MINERAL PRODUCTS.  
II.—CHEMICAL AND PHARMACEUTICAL PRODUCTS.  
III.—SUBSTANCES USED AS FOOD.  
IV.—VEGETABLE AND ANIMAL SUBSTANCES USED IN MANUFACTURES.

COLLECTED UNDER THE AUTHORITY OF THE



L273  
4-1964



# EXHIBITION OF 1851.

## ALPHABETICAL LIST OF EXHIBITORS' PROSPECTUSES.

### VOLUME I.

#### CLASS 1.

Beecroft, Butler, and Co.  
Bird, William, and Co.  
Cawley, Peter  
Clark, G. H.  
Luard, Beedham, and Co.  
Mayo and Co.  
Meinig, C.  
Methven, David, and Sons  
Miesback, Alvis  
Popelin Ducarre, Messrs.  
Stirling, Morries  
Stirling, Thomas, jun.  
Stirling  
Tennant, J.  
Vielle Montagne Cie.  
Watney,

#### CLASS 2.

Clifford, George  
Collins, R. N.  
Coppock, John  
Keating, Thomas  
Lamplough,  
Lefevre, B.  
Mason,  
Peacock, George  
\*Pownall and Protheroe  
Rossetlet, De

#### CLASS 3.

Appert, Mr.  
Chocolat, Choquart  
Colin, Joseph  
Dewar,  
Edwards, Henry  
Feyeux,  
Fry, J. S., and Sons  
Groult, Jun.  
De Lignac, Martin  
Du Liscoet, Fils, et Cie.  
Machet, S.  
Magnin, M.  
Miller, D. and W.  
Payne and Sons  
Sigaut, J.  
Wotherspoon, R.

#### CLASS 4.

Barker and Co.  
Burnett, Sir William  
\*Castelle, P.  
Claussen, Chevalier  
Fauntleroy, Robert, and Sons  
Granville and Co.  
Grenet, M.  
Jaillon, Moinier, and Cie  
Manning, James  
Massue,

## VOLUME II.

### CLASS 5.

Anderson,	Leclerc, M.
Appold,	Lee,
Atherton,	Merryweather,
Baddeley,	Morris, W.
Baskcomb, George Henry	Moussard, A.
Beckers, G. E.	Nicholl, W. L. and Co.
Bourdon, E.	Parsons, J.
Chaley, Jules	Penn, John, and Son
Cheavin, S.	Phillips
Conical Flour Mill Company	Pimlico Wheel Works
Corben and Sons	Pooley, H. and Son
Cunningham, and Carter	Puckering and Houlgate
Davies, David, and Son	Rock and Son
Delongueil, H.	Roe, Freeman
*Desouches, Duflos, and Cie.	Shalders, W., jun.
Dodds and Son	Shand and Mason
Drabble, J. and Co.	Shillibeer,
Drury, Francis	Shilton, Thomas
Dunaime,	*Smith, F. P.
Fourdrinier,	Stocker, Brothers
Franklinski,	*Stoltz, Fils
Fuller, G. and T.	Stothert, Slaughter, and Co.
Gossage,	Thomson, George
Hawthorn, R. and W.	Ward, John
Hayot,	Warner, J., and Sons
Heath,	Watts, Thomas
Holmes, H. and A.	Watt, James, and Co.
Hurry, H. C.	Whytehead, W. K.
Kesterton, Edwin	Willoughby, S.
Laignel, M.	

## VOLUME III.

### CLASS 6.

Baume, C. de la	Gaimes and Co.
Berthelot, N.	Gatti and Bolla
Black,	Harrison, J. and W.
Boucher, E. and Cie.	Furness, William
Claussen, Chevalier	Enfer, E.
Chrichton	Desplanqués, Jeune



VOLUME III—CLASS 6—*continued*.

* Hermann, G.	Parker, C., and Sons
Holtzapfell and Co.	Plummer, Robert
Jarrett, Griffith	Randell and Saunders
Lanenville, V.	Risler, G. A.
Lawrence, J.	Sandford, Owen, and Watson
Lawson, S., and Sons	Savage, A.
Macindoe,	Sherwin, Cope, and Co.
Mason, John	Sullivan, Thomas
Masterman,	Taylor, W.
Moureau, M. de Fontaine	Tylor and Son
* Mouchot, Frères	Waterlow
Müller, L., Fils	

## VOLUME IV.

## CLASS 7.

Bain, W.
Bauge, Ainié
Clive, J. H.
Cochrane,
* Croggon, and Co.
Ell, George
Every, S. F.
Forster, James
Hadley, C.
Hurwood,
Lacarrière, A.
M'Neill, F. and Co.
Quincey, Harcourt
Remington
Townley, William
Tuckey, R.
Wilkins, W. C.
Wilson, Thomas

## CLASS 8.

Baker, Thomas K.
Béringer,
Bernard, Albert
Bertonnet,
Claudin, F.

CLASS 8—*continued*.

Devisme, M.
Duclos,
Erskine,
Fairman, J.
Fletcher, Thomas
Gastinne, Renette
Gauvain,
Hawker, Col. P.
Hubbard, Charles
Humane Society, Royal
Jeffery, Walsh, and Co.
Lagrèze,
* Lahure,
Lefaucheux, M.
Light,
Manby, George W.
Porter,
Powell, Robert
Robertson,
Rodgers, Lieutenant William
Shaw, John
Shorman, John
Silver, S. W., and Co.
Sturdee, A. W.
* Trail, Chasemore, and Co.

## VOLUME V.

## CLASS 9.—PART 1.

Barrett, Exall, and Andrewes	Crosskill
Bigg, T.	Crowley, W.
Burgess and Key	Deane, Dray, and Deane
Burrell, C.	Fowler and Fry
Busby, W.	Garrett and Sons
Carson, H.	Gill and Ward
Clayton,	Gray and Son
Clayton, Shuttleworth, and Co.	Hancock, J. L.
Cooch, J.	Hayes, J.
Cornes	Hensman and Son
Cottam and Hallen	

## VOLUME VI.

## CLASS 9.—PART 2.

Arnheiter	Huxhams and Brown
Barber and Groom	Jones, P.
Bentall, E. H.	Lane, H. and Son
Bouchon, M.	Lavoisy
Coleman, R.	Macpherson, P.
Day and Millward	Marriott
Dench, E.	Merryweather
Eloff, M.	Milton, John
Florence Court Tile Works	Morewood and Rogers
Gidney, J. W.	Neighbour, G., and Son
Gueuvin, Bouchon, and Cie.	Newington, Dr. S.
Hill, E. and Co.	Phillips
Hill, William	Plenty, J. and E.
Holmes, J. and Sons	Poulet
Hornsby, R. and Son	Ransomes and May
Horsky, Francis	Read, Richard
Howard, J. and F.	Restell, R.
Hunter, W. and J.	Richmond and Chandler
Hurwood	Rome, R. M.



## VOLUME VII.

## CLASS 9.—PART 3.

Samuelson, B.	Vachon and Cie.
Sholl	Vielle Montagne Cie.
Smith, A. K.	Wedlake and Co.
Smith and Co.	Weir, Edward
Smith, William	Westrupp
Sorley, R. and Sons	Wheeler, Edward
Spiller and Tayler	Whitehead, John
Stanley, W. P.	Whitmee and Chapman
Thompson, H. A.	Williams, W.
Turner, E. R. and Co.	Winton and Sons
Tuxford, and Sons	Woodbourne, James

## VOLUME VIII.

## CLASS 10.—PART 1.

Abraham, A. and Co.	Frodsham, Charles
Alexander, William	Gavard, Adrien
Bailly, Comte	Goddard, J. T.
Baranowski, J. J.	*Gourdin
Bateman, Dr.	Grignon
Bennett, J.	Grosse, Frères
Bertaud, Jun.	Haggard, W. D.
Blaylock	Hall, G. F.
Breton, Frères	Hamilton, H. G.
Bridges, George	Holtzapffel and Co.
Brocot, A.	Jones, J.
Chaburn, Brothers	Keller, F. A. E.
Chavin	*Le Molt
Chevalier, Charles	Le Roy et Fils
Clement, Leon	Loseby
Collot, Frères	Lowry, Samuel
Cox	Macnair, A. and Co.
Davis, J.	Magnetic Telegraph Company
Desbordes	Marratt, J. S.
Detouche, M. C.	Mayall, J. E.
Dollond, George	Merryweather, G.
Duboseq, J.	Meusnier, Grignon
Edkins and Son	Mollison
Elisha, Caleb	Molteni and Siegler

VOLUME VIII—CLASS 10—*continued.*

Moser, George	Robert, Adolphe
Newton and Son	Rogers and Co.
Newman, J.	Shepherd, Charles
Orchard, J.	Thibert, Fils
Pierret	Thomas
Plagniol, A.	Thomson, Adam
Potonié, D. and C.	Thompson, J.
Quennessen	Troughton and Simms
Readhouse, Miss	Troupeau
Reid, William	Védy, F.
Reydor and Colin	Wagner, J.

## VOLUME IX.

## CLASS 10.—PART 2.

Alexandre and Fils	*Ducci, A. et M.
Anelli, J.	Ducroquet, M.
Aucher	Ennever, and Steedman
*Bernardel	*Errard
Bittner, David	*Fourneaux
Bord, A.	Franche
Brinsmead, J.	Greiner, G. F.
Bryceson, H.	Heaps, J. K.
Cadby, C.	*Herding, M.
Calcott, J.	Hill, William, and Co.
Calcott, W. H.	Holdich, G. M.
Case, George	Hopkinson, J. and J.
Chidley, Rock	Hunt, Richard
Clinton, J.	Jaulin, J.
Courtois, Antoine	Jenkins, W. and Sons
Dawson, C.	Jones, J. C. and Co.
Debain, A.	Jones, Bassett.
Dimoline, A.	Jordan, James
Dobrowolski, B. W.	Kirkman, J. and Son
Dodd, James	Köhler
Dodd, Edward	Lambert and Co.
Domény	Luff, George, and Son



VOLUME IX—CLASS 10—*continued.*

Matthews, William	Siccama, A.
Montal	Snell, R.
Mott	Stodart, W. and Son
Muller, Alexander	Towns and Packer
Peachey, George	Van Overbergh
Prince, Miss	Ventura, A. B.
Roller, et Blanchet, Fils	Walker, J. W.
Roome, T. F.	Ward, C.
*Sax, Adolphe, and C <sup>ie</sup> .	Willis, H.
Scholtus	Woolley
Seuffert, Eduard	

## VOLUME X.

## CLASS 10.—PART 3.

Arnott, J.	Heeps, J. H.
Atkinson, B. F.	Heeps, Mrs.
Auzout, Dr.	Henry, M.
Badcock, J.	Holtzapffel and Co.
Batka, W.	Huxley
Binyon, A.	Lanagan, F.
Biondetti, H.	Lawrence and Co.
Blackwell	Le Perdriel
Bossingham, B.	Lüer
Caplin, J.	Mathews, W.
*Carteaux and Chaillon	Mathieu, L.
Chapman and Alderman	Miles, Edward
Charrière	Pulvermacher, J. L.
Coffey and Smith	Reid, Dr. R.
*Coles	Simon, Paul
Cook and Williams	Simpson, George
Davis	*Sirhenry
Delieul	Sparks and Co.
Dinsdale	Statham
Eagland, Thomas	Tod, David
Ellis, Joseph	Vié
Grossmith, W. R.	White
Harnett, William	Wood, W. R.

## VOLUME XI.

## CLASSES 12 &amp; 15.

Bacot, Paul, and Fils  
 Hutchison  
 Keith and Co.  
 Lipski, I.  
 Morgan, J., and Co.  
 Norton, Joseph  
 Requillart, Roussel, & Choqueel  
 Schwann, Kell, and Co.  
 Schwann, F.  
 Smith, J. B., and Co.  
 Stewart, Robert  
 Strakosch, S., and Son  
 Tricot, Brothers

## CLASS 13.

Dutrou, Fils  
 Suisse, Zurich Canton de

## CLASS 16.

Bathier  
 \* Bridle, French  
 Browne, Frederick  
 Caistor  
 Clark, C. and J.  
 Cox  
 Cremer and Co.  
 Dax, R.  
 Deed, J. S.  
 Dowie, James  
 Estivant, Frères  
 Gibson and Co.  
 Green, R.  
 Groisat, F.  
 Grundy, I.  
 Hall, J. Sparkes  
 Hall, Richard

## CLASS 16—continued.

Hawkins, J.  
 Houette A. and C<sup>ie</sup>.  
 Kane, Gregory  
 Lennan, William  
 \* Lefébure, J. P.  
 Liégard, M.  
 Moriarty  
 Nicholay, and Son  
 Peltureau, le J., Frères  
 Penny, J.  
 \* Phipps, W. D.  
 Prévô  
 Ramsey, William  
 Reede  
 Swaine and Co.  
 Ureh, H.  
 Vick, R. M.

## CLASS 17.

Angraud  
 Austria—Vienna  
 Bailliere, J.  
 \* Béguin  
 Benner, William  
 Berthault, et Fils  
 Blind School, Avenue Road  
 Claye, J.  
 \* Desrosiers, M.  
 Du Marais Paper Mills  
 Dupont, Paul  
 Ellis, A. J.  
 Gaume, Brothers  
 Gide and Baudry  
 Glanz, P.  
 Gratiot, Amédée  
 \* Grosselin, A.  
 Hood, J. H.



VOLUME XI—CLASS 17—*continued.*

\*Langlois et Leclercq  
 Lebrun  
 \*Legrand, Marcellin  
 Lortie, M.  
 Mallat  
 Mame, A., and Co.  
 Marchesi, G. B.  
 Marion  
 Mathias, L.  
 Niedrée, and C<sup>ie</sup>.  
 Obry, Bernard, and Co.  
 \*Odent, Sons, and Co.

Pitman, Isaac  
 Plon, Frères  
 Plowman  
 Quincey, Harcourt  
 Ruff, E., and Co.  
 Schlesinger, J., and Co.  
 \*Texier, V.  
 Tupper, M. F.  
 Whiteman, F. J.  
 Williams, H.  
 Wyld, James

## VOLUME XII.

## CLASS 18.

Clarke, Jabez  
 Lecrosnier, M. L.  
 Mourceau, H.  
 Ringuet, Le Prince

## CLASS 19.

Bertèche, Chesnon & C<sup>ie</sup>.  
 Butchers, Misses  
 Newton, Jones, and Willis  
 Switzerland (Section 3)  
 Underwood and Co.  
 Vaugois and Truchy

## CLASS 20.

Bain, W.  
 Barber, Samnel  
 Biétry, L., et Fils  
 Brie and Jeofrin  
 Burbach, G., and Co.  
 Caplin, M. and M.  
 Capper and Son

CLASS 20—*continued.*

Darnet, D.  
 Fumet  
 Josselin  
 Jouvin and C<sup>ie</sup>.  
 \*Laydet and C<sup>ie</sup>.  
 Magé, Jun.  
 Macdougall, D.  
 Milon, Ainé  
 Moreau and C<sup>ie</sup>.  
 Reid, William  
 Roberts, E. B.  
 Roberts, G.  
 Smith, Mrs. J.  
 Standen, A.  
 Welch, Margetson, and Co.

## CLASS 21.

Cowvan, B. and S.  
 Hill, Joseph  
 \*Mechi, J. J.  
 Moseley, J. and Sons  
 Picault  
 Tyzack, J.

## VOLUME XIII.

## CLASS 22.—PART 1.

Barlow, James	Edwards, D. O.
Benham and Sons	Farrow, Charles
Biddell, G. A.	Flavel, Sydney
Bowling Iron Company	Fryer
Bray, Charles	Gagneau, Frères
Bricard and Gauthier	Gandillot and Cie.
Brown, E.	Garton and Jarvis
Brown, Henry, and Sons	Goodbehere, G. T., and Co.
Burton, W. S.	*Green, S. and Co.
Carrier-Rouge	Groult and Cie
Chalklen and Bonham	Guest and Chrimes
Charles, S. and Cie.	Hadrot
Chubb, John	Haldane and Rae
Cocker and Sons	Hart and Sons
Cooper, G.	Hayward, Brothers
Cotterill, Edward	Hodges, J., and Sons
Crook, W.	Holliday, R., and Co.
Cugnot, Amédee	Huxley, Heriot, and Co.
Defries	*Japy, Frères
Ducommun	Jennings
Duley	Jobson
Duval and Cie.	Johnson, Cammell, and Co.
Edge and Son	Keith, George
Edwards, F.	Kent, George

## VOLUME XIV.

## CLASS 22.—PART 2.

Laury, G.	Masters, T., and Co.
* Lambert, T., and Son	Metropolitan Light Company
Lawrence and Co.	Milner, W.
Lecocq	Moore
Macalpine	Noirsain, Jules
Mairet, fils	Paublan
Mapplebeck and Lowe	Pearson, W. and Co.
Marsden	Perkes, Samuel, and Co.



VOLUME XIV—CLASS 22—*continued.*

Peterson, T.	Steer and Webster
Pierce	Stutterd
Pieron, L.	Tann, E., and Sons
*Raworth, B. P.	Tasker
Rickets, Charles	Treggon and Co.
Riddle, William	Tronchon
Roux and Fortin	Truc, C.
Saget, V.	Tuppar and Carr
Sanderson, Brothers	Tylor, J., and Son
Sarson, I. F.	Tylor and Pace
Shears	Unwin and Rodgers
Sheldon, John	Verstaen
Sherwin, J.	Warner, J., and Sons
Sherwood Iron Works	Wesson, P.
*Ship Cooking-Apparatus	Woodin, D.
Smith, Thomas	Yates, Haywood, and Co.
Steele, W. and P.	Young, W.

## VOLUME XV.

## CLASS 23.

Angell, Joseph	Mortimer, W. H.
*Backes, J. F., and Co.	*Payen, junior
Bruneau	Phillips, Brothers
Christoffle, C., and C <sup>ie</sup> .	Philip
Durand	Ratte, L.
Garrard, R. S., and Co.	Restell, R.
Gass, S. H., and D.	Rouvenal, L.
Hennequin	Rudolphi
Hunt and Roskell	Rusand, P. P.
Lateltin and Payen	Savard
Lee, B.	Savary and Mosbach
Lemonnier and Co.	Thouret
Lobkowitz, Prince of	Waterhouse and Co.
Mayer, Joseph	Winckelmann
Morel and Co.	Yates, Thomas

VOLUME XV—*continued.*

## CLASS 24.

Apsley, Pellatt, and Co.  
 \* Burgun, Walter, Berger, and C<sup>ie</sup>.  
 Cogan and Co.  
 Lahoeche  
 Luce  
 Naylor, William

## CLASS 25.

Bettignies, Maximilien de  
 Copeland  
 \* Fiolet, Louis  
 Gille, Jeune  
 \* Henneberg, F. E., and Co.  
 Honorè, Edward  
 Levy, Frères, and C<sup>ie</sup>.  
 Mayer and C<sup>ie</sup>.  
 Ridgway J. and Co.

## CLASS 26.

Association des Ouvriers Ebe-  
 nistes  
 Audot  
 Balny, jun.  
 Beaufls  
 Bellangé  
 \* Bouhardet  
 Brown, Brothers  
 \* Brown, Joseph  
 Cottam, E.  
 Cremer  
 Daubet and Dumarest  
 Descartes  
 Dupont, Auguste  
 Durand

CLASS 26—*continued.*

\* Faure  
 Feron  
 Florange, jun.  
 Fourdinois  
 French, G. J.  
 Gocht  
 Grundy, J. C.  
 Hawkins, Samuel  
 Jeanselme  
 \* Jolly-Leclerc  
 King, W. A.  
 Kissel, Lit  
 Krieger and C<sup>ie</sup>.  
 Laurent  
 Lemaire, A.  
 Maillard  
 Marcellin  
 \* Marseaux and Legrand  
 \* Mechi, J. J.  
 Mercier  
 Minter, G.  
 Norwood, Charles  
 Palmer, R.  
 Pretot and C<sup>ie</sup>.  
 Riddett  
 Ridge, Benjamin  
 Rivart et Andrieux  
 Schiertz  
 Simpson, George  
 Sopwith, T. and J.  
 Spiers and Son  
 Tahan  
 Townshend, J. E.  
 Turner, H. N., and Co.  
 Van, Balthoven  
 Wells, E.



## VOLUME XVI.

## CLASS 27.

Ambrose, J.  
 Desauges  
 \*Dupuis  
 Haywood, H. and R.  
 Kent, H. B.  
 Society for Improving the Con-  
   dition of the Labouring  
   Classes  
 Serpentine Company  
 Stevens and Son  
 Stirling, T., sen.  
 Valentia Slate  
 Westminster Marble Company  
 Workman, J.

## CLASS 28.

Baker, Charles  
 City Saw Mills  
 Cording, J. C.  
 Gutta Percha Company  
 Hancock, J. L.  
 Lockington, Bunn, and Co.  
 Mackintosh, C. and Co.  
 Matthews, S.  
 Meadows, John  
 Pitet, Aine  
 Robinson, V. and Co.  
 Ross, and Sons  
 Smith, Thomas  
 Treloar, T.  
 Truefitt, H. P.  
 Walker, Thomas  
 Winterborn

## CLASS 29.

\*Allard et Claye  
 Asprey, Charles  
 Aucoc, Aine  
 Boss, I. A.  
 Bully, Jean Vincent  
 Cazal  
 Constantin  
 Duthoit, D., and Co.  
 Farina, J. M.  
 Foster, Son, and Duncum  
 Fresne, Gaudet, du  
 Gellé, Frères  
 James, John  
 Kirby, Beard, and Co.  
 Leistner  
 Lloyd, A.  
 Loddé  
 \*Martin, Aine  
 \*Mechi, J. J.  
 Medway, James  
 Montignac  
 Oger, M.  
 Payne, G.  
 Perrot, Petit, and Cie.  
 Plasse  
 Price's Patent Candle Company  
 Temple, Mrs.  
 Thwaites and Co.  
 Tilman  
 Rimmel, Eugene  
 Rowland  
 Schloss et Frère  
 Yerbury, John

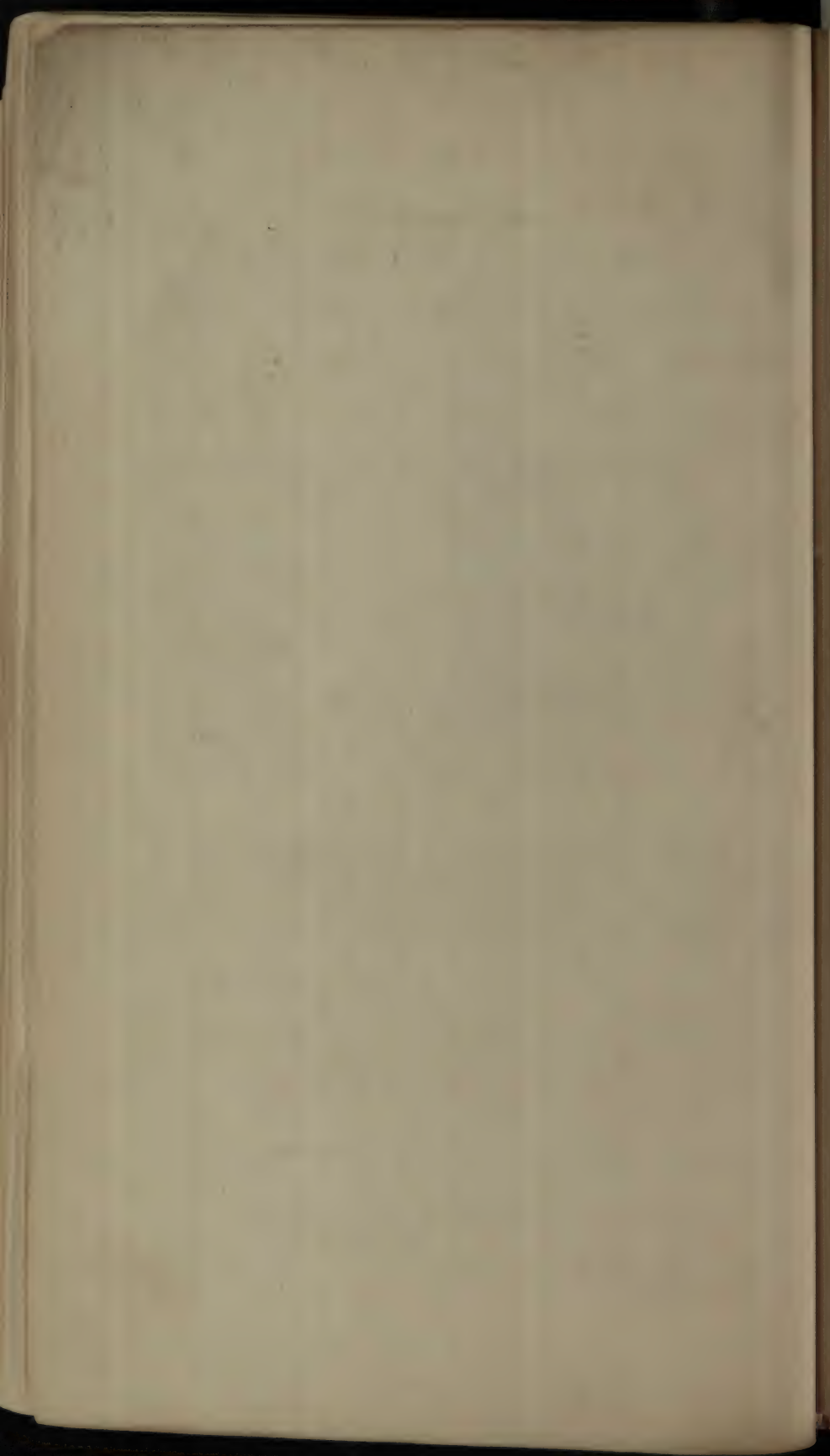
## CLASS 30.

Allix	*Lauret, Frères
Avisseau	Laurent, Francois
* Barrère	Leake, F. and Co.
Bontems	Lerolle, Frères
Boulonnois	Marchand, J. B.
Boyer	Matifat,
Cookes and Sons	Maucomble,
* Della Valle J. and J.	Miroy, Frères
Faye	Paillard, Victor
Fetu, Jacques	Roberson, C. and Co.
Froment, Meurice	Rogers, W. G.
Gilbert and Co.	Rowney, G. and Co.
Gillot, F.	Switzerland (Section 4)
Green and Fahey	*Theret, M.
Gueyton, A.	Villemsens, F.
Hardtmuth, L. and C.	Vittoz, E. and Cie.
Harris, John	Weygand, A.
Holland, William	Yon, V.
Lambertye, P. C.	

The names marked thus \* have not furnished a sufficient number of Prospectuses to render the series complete.







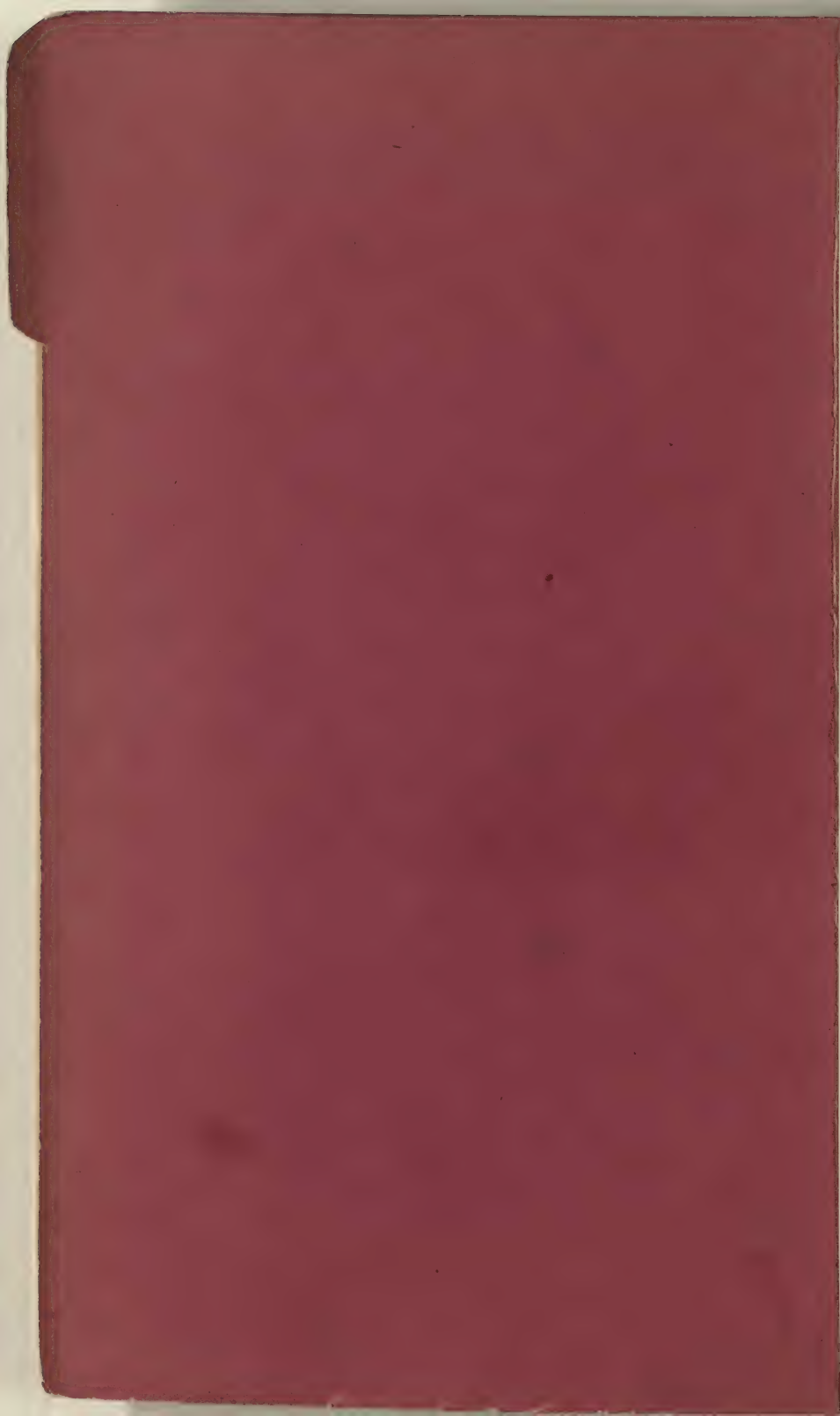


RAW MATERIALS.

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CLASS I.

MINING AND MINERAL PRODUCTS.





# EXHIBITION OF 1851.

## ALPHABETICAL LIST OF EXHIBITORS' PROSPECTUSES.

### VOLUME I.

#### CLASS 1.

Beecroft, Butler, and Co.  
Bird, William, and Co.  
Cawley, Peter  
Clark, G. H.  
Luard, Beedham, and Co.  
Mayo and Co.  
Meinig, C.  
Methven, David, and Sons  
Miesback, Alvis  
Popelin Ducarre, Messrs.  
Stirling, Morries  
Stirling, Thomas, jun.  
Stirling  
Tennant, J.  
Vielle Montagne C<sup>ie</sup>.  
Watney,

#### CLASS 2.

Clifford, George  
Collins, R. N.  
Coppock, John  
Keating, Thomas  
Lamplough,  
Lefevre, B.  
Mason,  
Peacock, George  
\* Pownall and Protheroe  
Rosselet, De

#### CLASS 3.

Appert, Mr.  
Chocolat, Choquart  
Colin, Joseph  
Dewar,  
Edwards, Henry  
Feyeux,  
Fry, J. S., and Sons  
Groult, Jun.  
De Lignac, Martin  
Du Liscoet, Fils, et C<sup>ie</sup>.  
Machet, S.  
Magnin, M.  
Miller, D. and W.  
Payne and Sons  
Sigaut, J.  
Wotherspoon, R.

#### CLASS 4.

Barker and Co.  
Burnett, Sir William  
\*Castelle, P.  
Claussen, Chevalier  
Fauntleroy, Robert, and Sons  
Granville and Co.  
Grenet, M.  
Jaillon, Moinier, and C<sup>ie</sup>  
Manning, James  
Massue,

The names marked thus \* have not furnished a sufficient number of Prospectuses to render the series complete.

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AMERICAN PEOPLE

FROM THE FIRST SETTLEMENTS TO THE PRESENT TIME

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DESCRIPTIVE CATALOGUE  
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ON INSPECTION AT THE EXHIBITION  
OF THE WORKS OF INDUSTRY OF ALL NATIONS,

**HYDE-PARK, LONDON, MAY 1st, 1851.**



LEEDS :

PRINTED BY ANTHONY PICKARD.

M DCCC LI.





CLASSES Nos. 1 & 5.

GREAT EXHIBITION

Of the Works of Industry of all Nations,

HYDE-PARK, LONDON,

OPENED MAY 1<sup>ST</sup>, 1851.

A

DESCRIPTIVE CATALOGUE

OF

ARTICLES

MANUFACTURED AND EXHIBITED

BY

**BEECROFT, BUTLER, & CO.,**

IRON AND STEEL MANUFACTURERS, ENGINEERS,

AND IRON AND BRASS FOUNDERS, &c.,

KIRKSTALL FORGE, NEAR LEEDS.

*Office in London—8, PANCRAS-LANE, CITY,*

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## CLASS 1.

412.

- 316 Railway Tire Bar, *bent Cold*, in forged state, to shew toughness, soundness, and strength of material.
- 286 Specimen of best quality Railway Tire Bar, in forged state, *broken*, to shew fibre in fracture.
- |                 |     |     |     |
|-----------------|-----|-----|-----|
| 262 Specimen of | Do. | Do. | Do. |
| 285 Specimen of | Do. | Do. | Do. |
| 295 Specimen of | Do. | Do. | Do. |
- 282 Specimen of Railway Tire Bar, best quality, in forged state, *Cut*, to shew mode of manufacture and soundness.
- |                 |     |     |     |
|-----------------|-----|-----|-----|
| 283 Specimen of | Do. | Do. | Do. |
| 284 Specimen of | Do. | Do. | Do. |
- 248 Railway Carriage Axle, best double fagoted, in forged state, *bent Cold*, to shew toughness, soundness, and strength of material.



259 Specimen of Railway Carriage Axle, *broken*, to shew fibre in fracture, and soundness.

179 Specimen of Railway Axle, in forged state, *Cut*, to shew mode of manufacture and soundness.

180 Specimen of Do. Do. Do.

256 Specimen of Do. Do. Do.

Also, Five other Specimens, similar to the above.

334 One Tension Bar, of best Kirkstall Iron, *torn asunder* by 135 Tons by hydraulic pressure.

332 Specimen of Chain Cable Iron, *bent Cold*, to shew toughness, soundness, and strength of material.

333 Specimen of Do. Do., *Cut*, to shew fibre, &c.

.....Specimen of Do. Do. Do.

.....Five Specimens of best Kirkstall Square Bar Iron, *Cut*, to shew fibre and soundness.

342 Specimen of Bar Iron, in rolled state.

345 Two Walking Sticks, twisted, of the above Iron.

.....Specimen of best double fagoted Axle, for Carriages, Omnibuses, &c., *bent and twisted*, to shew toughness and strength.

## CLASS 5.

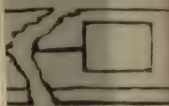
646.

- 317 Railway Carriage Axle, best double fagoted, in forged state, *bent Cold*, to shew toughness, soundness, and strength of material.
- .....Specimen of Railway Carriage Axle, *broken*, to shew fibre in fracture, and soundness.
- 296 Railway Tire, *bent Cold*, in forged state, to shew toughness, soundness, and strength of material.
- 297 Specimen of best quality Railway Tire Bar, in forged state, *broken*, to shew fibre in fracture.
- 281 Specimen of best quality Railway Tire Bar, in forged state, *Cut*, to shew mode of manufacture and soundness.
- 307 Specimen of double-fagoted Cart Axle, for Carts, Waggons, Drays, &c., *bent and twisted*, to shew toughness and strength.

## RAILWAY WHEELS AND AXLES.

Nos. 1, 2, 3, 4, 5, 6. Specimens of the various kinds of Railway Wheels now used and most approved on the Railways generally.

Nos. 1 and 2. Entire Wrought Iron Wheels, 3 feet diameter, with single and double spokes.





The spokes, boss, and rim are forged solid in one piece. These Wheels are adapted with a view to safety for "Fast" and "Express" Trains, and, from the nature and disposition of the material, have decided superiority in point of lightness and durability.

Nos. 3, 4, 5, and 6. Compound Wheels of Cast and Wrought Iron for ordinary trains, and of various modifications of construction.

Nos. 7 and 8. Improved Wheels, with wrought iron disc centres and solid wrought iron bosses. The disc centres are dished, flanged, and punched, all at one process, by hydraulic pressure. The tires are dove-tailed to the flanged rims to supersede rivets.

All the above wheels have tires of improved Kirkstall manufacture, combining hardness of surface with toughness of texture: also, double-fagoted Axles, of improved Kirkstall manufacture.

#### BERRY'S SELF-ACTING REGULATING DAMPER FOR HIGH PRESSURE BOILERS.

The cylinder of the apparatus having constant communication with the steam in the boiler, the piston working within the cylinder is forced *upwards* as the pressure of the steam increases; and this movement, being communicated by rack and pinion, *closes* the damper. Any decrease in the pressure of the steam gives the piston liberty

to *descend* by the re-action of a spiral spring, acting within the cylinder upon the top of the piston, and this *downward* movement being, in like manner, communicated by rack and pinion, *opens* the damper. "The Self-Acting Regulating" process is, therefore, constantly operating, for the slightest excess or diminution in the elasticity of the steam at once acts upon the damper.

The apparatus is likewise a "Safety Valve," for provision is made for a copious discharge of steam when, by an undue pressure, the piston is forced upwards beyond a certain point.

ILLINGWORTH'S IMPROVED MOVEABLE ECCENTRIC  
TUMBLER,—REGISTERED.

By this Tumbler the slide valves of a steam engine can be *set*, and the *lead* altered, to the greatest nicety, and at pleasure, whilst the engine is at work, without the trouble and stoppage attending the present mode of accomplishing this object.

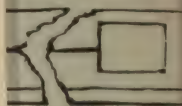


**CLASS 5 Continued.**

- 1 One pair 3 in. Waggon Axles, steeled, with hard metal bushes.
- 2 One pair 3 in. Waggon Axles, steeled, with slit cones and hard metal bushes.
- 3 One pair 3 in. Waggon Axles, case hardened, with loose collar and washer and chilled bushes.
- 4 One pair 3 in. Patent Waggon Axles, case hardened, with round linch-pin, brass cover, chilled bushes, and brass cap.
- 5 One pair 3 in. Patent Waggon Axles, case hardened, with square linch-pin and set screw, chilled bushes, and brass caps.
- 6 One pair  $2\frac{1}{2}$  in. Patent Cylinder Waggon Axles, case hardened, with hardened bushes and brass cap.
- 7 One pair  $2\frac{1}{2}$  in. Improved Cart or Waggon Axles, case hardened, with brass anti-friction rollers, hardened bush, and brass cap.
- 8 One  $1\frac{5}{8}$  in. Mail Axle, case hardened, with wrought iron case hardened bush, and right and left hand nut.
- 9 One  $1\frac{5}{8}$  in. Mail Axle, case hardened, with hardened bush, long bolts, back and front plates, and octagon brass cap.



- 10 One  $1\frac{5}{8}$  in. Mail Axle, case hardened, with hardened bush, short screw and back plates, octagon brass caps.
- 11 One  $1\frac{5}{8}$  in. Mail Axle, case hardened, with hardened bush, bevil brass ends, and oil screw, long bolts, and back and front plates.
- 12 One  $1\frac{5}{8}$  in. Mail Axle, case hardened, with hardened bush, long bolts, back and front plates, plain brass end, and oil screw.
- 13 One  $1\frac{5}{8}$  in. Mail Axle, case hardened, with hardened bush, long bolts, back and front plates, and solid ends.
- 14 One  $1\frac{5}{8}$  in. Improved Mail Axle, case hardened, with hardened bush, long bolts, back and front plates, and octagonal brass caps.
- 15 One Whitechapel Mail Axle,  $1\frac{5}{8}$  in., case hardened, with chilled bushes, long bolts, back and front plates, and octagon brass caps.
- 16 One 2 in. Improved Van Axle, case hardened, with chilled bushes, wrought iron cone, and set screw for linch pin, brass cap, and oil screw.
- 17 One  $2\frac{1}{4}$  in. Improved Omnibus Axle-tree, case hardened, with chilled bushes, compassed, solid butterfly flaps, brass caps, cones, and brass nuts.
- 18 One  $1\frac{3}{4}$  in. Improved Cranked Cab Axle, case hardened, with chilled bushes, solid flaps, cones, set screw, and brass caps.
- 19 One  $1\frac{5}{8}$  in. Improved Collinge's Axle, case hardened,



- with hardened bushes, brass nuts, and collets, and brass caps.
- 20 One  $1\frac{5}{8}$  in. Improved Collinge's India Axle, case hardened, with bell metal bush, iron collets, case hardened, brass nuts, and caps.
  - 21 One  $1\frac{5}{8}$  in. Improved Collinge's Axle, case hardened, with hardened bush, brass combined collets, nuts, and caps.
  - 22 One  $1\frac{1}{4}$  in. Improved Tubular Mail Axle, case hardened, with bell metal bushes, brass moon plate, and wrought iron nuts, with fixed bushes and rotatory axle, and sham caps.
  - 23 One  $1\frac{5}{8}$  in. Improved Patent Van Axle, case hardened, with chilled bush and brass caps, through beds, and solid flaps.
  - 24 One  $2\frac{1}{4}$  in. Improved Patent Coach Axle, case hardened, with chilled bush, brass cap, slit nut, right and left hand, and linch-pin.
  - 25 One  $1\frac{1}{2}$  in. Improved Mail Axle, case hardened, hardened bush, with brass moon plate screwed on.
  - 26 One  $1\frac{1}{2}$  in. Improved Common Mail Axle, case hardened, with hardened parallel bush, and canted case hardened nuts.
  - 27 One  $1\frac{1}{2}$  in. Improved Common Mail Axle, case hardened, with hard metal bush, and right and left hand nut.
  - 28 One  $1\frac{1}{2}$  in. Improved Collinge's Axle, with hardened bush.

**BEECROFT, BUTLER, & CO.,**  
**IRON & STEEL MANUFACTURERS & MERCHANTS,**  
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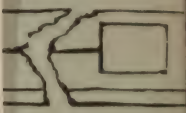
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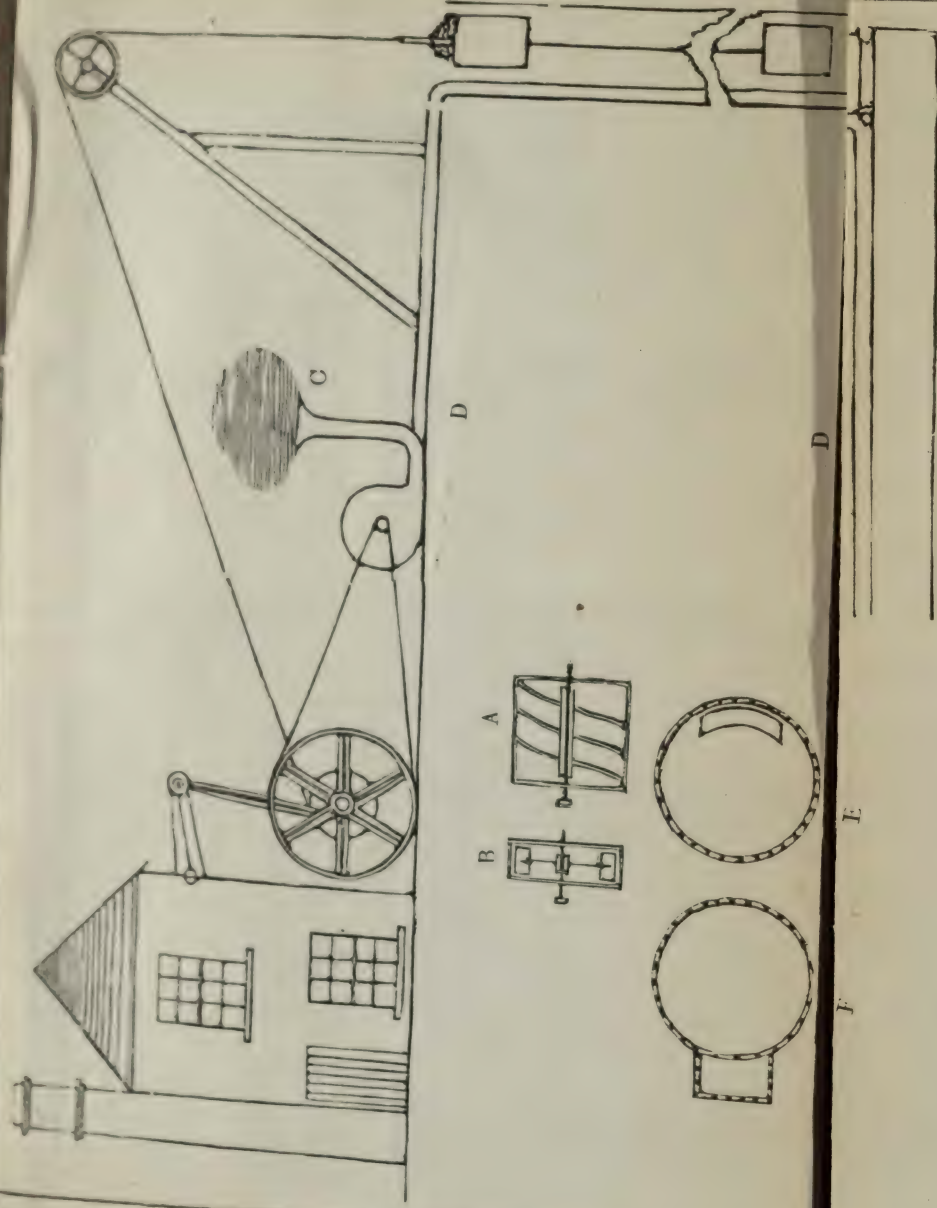
D



in 6 m n H t a l f e in ra it







A. B., Sections of Fans.—C., Discharge Pipe.—D. D., Iron Piping to any part of Workings.—E. F., Application to Shafts.

## APPARATUS FOR PREVENTING EXPLOSIONS IN COAL MINES,

INVENTED BY PETER CAWLEY, SOHO, NEAR BIRMINGHAM

The above apparatus consists of a Fan working in a close case, and connected with the Mine by light sheet iron pipes, (which in order to be durable may be made of galvanized iron, of which material they may be obtained from 6 to 12 inches diameter, from 9d. to 1s. per lineal foot) which pipes are in intended to be carried along the roof of the workings to the extreme parts of the mines, and may be carried forward as the workings proceed; or they may be carried into those immense receptacles called "goals" or "gobs," which are found in some mines. As the Fan displaces the foul gasses, a current of pure atmospheric air will, of course, rush down the shaft, and carry all at the same time, and by the same operation, remove the bad, and induct good air: and by this means will from the very spot where they are generated, it prevents them spreading through the mine, which even in small and insignificant quantities is very prejudicial to the miner's health.

This apparatus could displace 7000 cubic feet of air in one minute, even when driven at a comparatively slow rate of speed, and in 30 minutes could so clear out the largest coal mine in Britain of all explosive gasses as to make it perfectly safe, and of course the expense of pipes through to workings or in the shaft is of very little moment when considered in connection with the proper working of the mine, and safety to men's lives.

The Fan and Pipes would be the only additional expense in the application of this apparatus, as it could be worked immediately from the winding engine, and at a very small cost, as working the Fan at the quickest speed for 30 or 40 minutes before the miners enter the mine, would prepare the workings for their reception; and by putting the Fan on a slow rate of speed, so as to cause a gentle draught and current through the workings, thereby removing the gasses as they issue from the minerals, the power required would be a mere trifle, and on a coal bank the expense would be so very small as to be scarcely calculable. And when it is taken into consideration the expense of having two shafts, one downcast, and one upcast, which in many places is found indispensable under the present system, (where one shaft might do) the balance will be decidedly in favor of this plan, seeing it will at the same time be much more effective.

It is purposed to use either the screw Fan, (A) or the common blade Fan, (B) [see sections] as may be found most suitable for peculiar circumstances.

In order that the pipe which is placed in the shaft may take up as little room and be as much out of the way as possible, I propose to apply it as in Fig. E., to shafts that are already formed; but in applying the apparatus to new shafts, I would have a brick culvert or pipe built outside, as in Fig. F.

For further information required, address,

*Peter Cawley, Soho, near Birmingham*





# PARTICULARS AND DESCRIPTION OF STONE EXHIBITED

AT THE GREAT EXHIBITION, CLASS 1, No. 190,

BY

**G. H. CLARK,**  
**GENERAL STONE MERCHANT AND AGENT,**  
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FROM THE QUARRIES OF HIS GRACE THE DUKE OF SOMERSET, AT HAYTOR, SOUTH DEVON,

NOW BEING WORKED BY

**THE DEVON HAYTOR GRANITE COMPANY.**

This superior Granite can be supplied in Ashlar and Blocks from 1 Ton and upwards, its great strength and durability render it a very desirable Stone for the construction of Bridges, Docks, Harbours, &c., also Tramways, and Kerbs of every Dimension.

It is not generally known that the Granite produced from these Quarries is superior to that of any other, either in England or Scotland, both in hardness and durability; such, however, is the case. From experiments made by subjecting blocks of various kinds to Hydrostatic pressure, it was ascertained that the crushing pressure per inch superficial was as follows:—

|                                                     |      |
|-----------------------------------------------------|------|
| The Penryn Granite broke under the pressure of..... | 3.15 |
| Peterhead (blue).....                               | 4.36 |
| Aberdeen (blue).....                                | 4.64 |
| Peterhead (red).....                                | 4.88 |
| Dartmoor.....                                       | 5.48 |
| Haytor.....                                         | 6.19 |

By experiments made on the comparative wear of Aberdeen, Dartmoor, and Haytor Granite, made on the Commercial Road, London, by JAMES WALKER, Esq., Engineer, extending over a period of seventeen months, it was ascertained that the loss per foot superficial, by friction, was as follows:—

|                      |          |
|----------------------|----------|
| In the Aberdeen..... | lbs. 3.0 |
| Dartmoor.....        | 2.778    |
| Haytor, only.....    | 1.915    |

The results clearly prove the immense superiority of the Haytor Granite, whether subjected to pressure or friction, and, consequently, its greater durability and value.

Granite from these Quarries has already been used in the construction of the following, among many of our Public

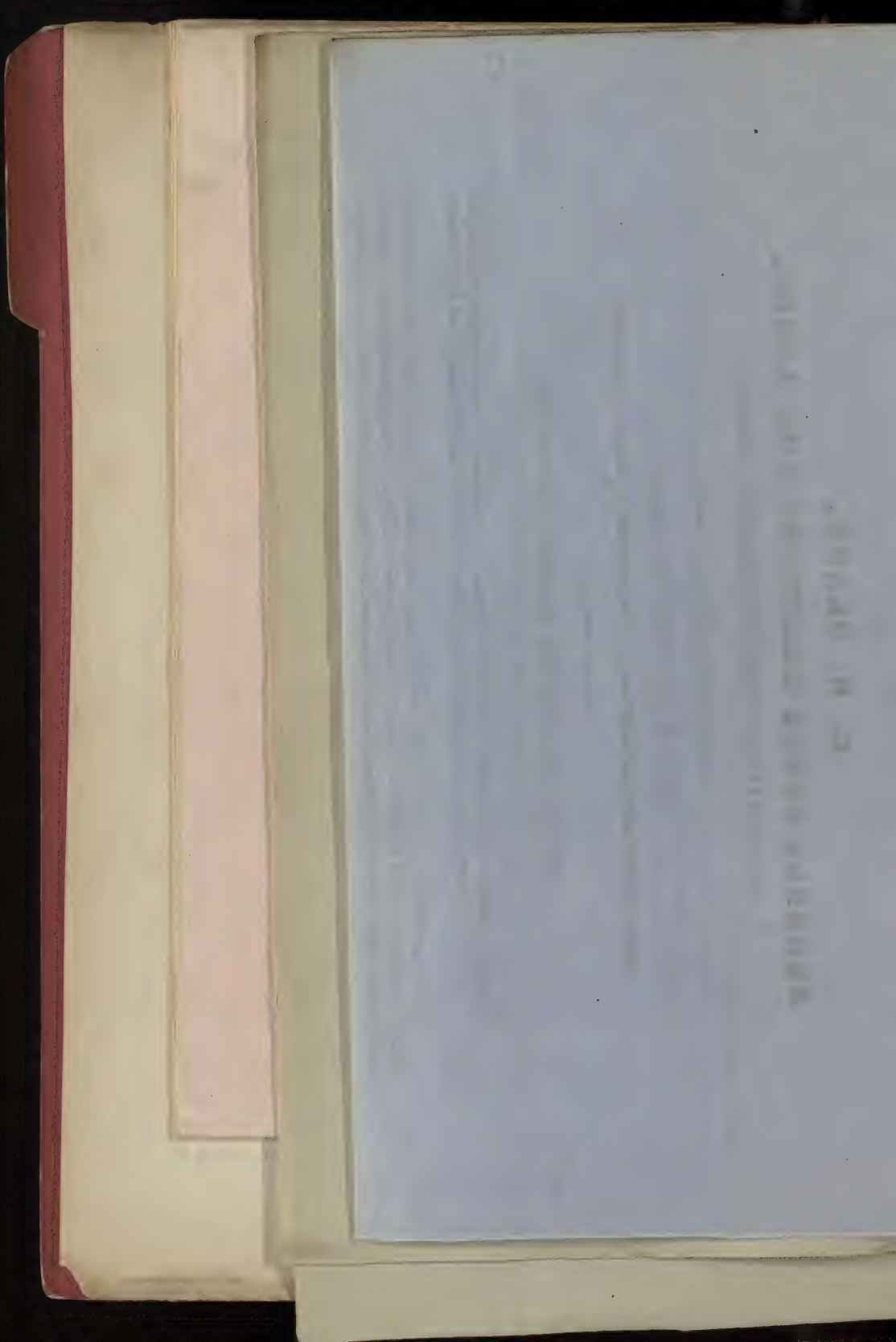
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| Buildings:—                   | AND IN THE GREAT ARCH OF |
| LONDON BRIDGE,                | TOTHILLFIELDS PRISON.    |
| GOLDSMITHS' HALL,             |                          |
| BRITISH MUSEUM,               |                          |
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In the latter building there is one Stone that weighed 33 Tons.

For further Information, Prices, &c., apply to the Office of the Devon Haytor Granite Company, 59, KING WILLIAM STREET, LONDON, or to

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*This Stone is also applicable for all general purposes where Sand Stone is used, for its durability & lightness, and Berwick, may be quoted, being several centuries old ; it was also used for the Construction of that Gigantic Work, the ROYAL BORDER BRIDGE AND VIADUCT, at Berwick-on-Tweed.*

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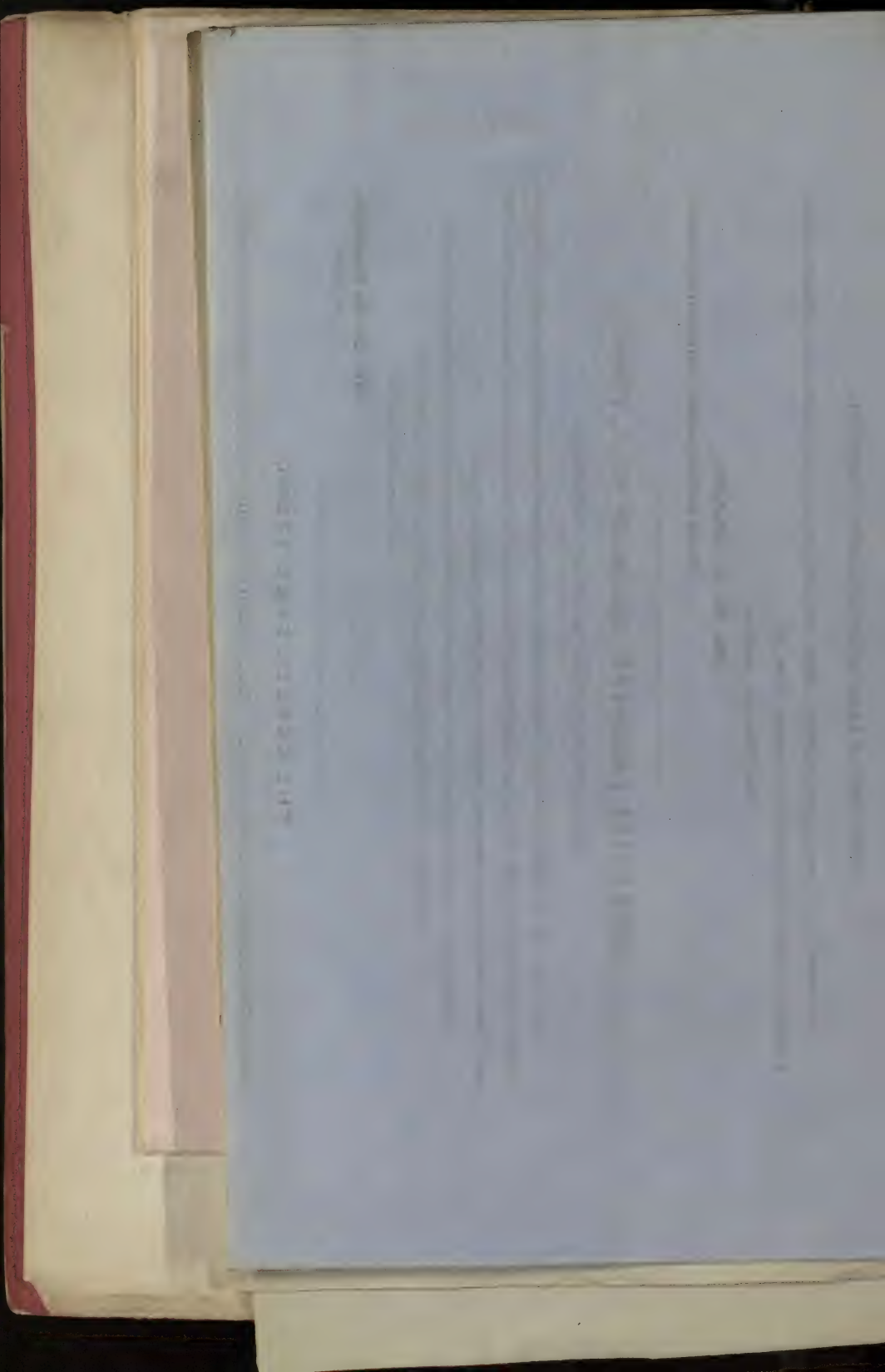
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This Granite was most extensively used for the Road round the Great Exhibition, Hyde Park, London, and for the Metalling of Roads, is a most excellent article.

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2. Specimens of Caen Stone from the outside of St. Stephen's Chapel, Westminster, A.D. 1530, presented by C. H. SMITH, Esq.
3. Specimen of Caen Stone from the top of turret of St. Stephen's Church, at Caen, 11th century.
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10. Ditto from the coping of the boundary wall of the ancient Castle of Falaise (the birth-place of William the Conqueror,); this coping, the arris of which is still quite perfect, was fixed early in the 17th century.
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|                                                                                                                                |                                     |
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| Ditto for external works, at Caen Wharf, Rotherhithe, London, per foot cubic .....                                             | 1s. 2d.                             |
| Ditto delivered alongside wharf to Sea Ports on the East, West, and South Coasts of England, from the Humber to Anglesea ..... | 1s. 2d.                             |
| Ditto to Ireland and Scotland, extra .....                                                                                     | per foot, 1d. to 2d.                |
| Aubigny Stone, shipped at Caen, average size blocks, .....                                                                     | 1s. 3d.                             |
| Ditto at Caen Wharf, Rotherhithe .....                                                                                         | 1s. 10d.                            |
| Ditto, delivered alongside wharf to Sea Ports on the East, West, or South Coasts .....                                         | per foot 1s. 10d.                   |
| Ditto to Scotland or Ireland, extra .....                                                                                      | 1d. to 2d.                          |
| Ranville Stone same price as Caen Stone.                                                                                       |                                     |
| I. B.—The above quotations are subject to alterations by local and port charges.                                               |                                     |
| Delivery by Railway, .....                                                                                                     | per mile, from 1d. to 1½d. per ton. |
| Ditto by Road Conveyance .....                                                                                                 | " " 9d. to 1s. "                    |
| Ditto by Barge in the Thames .....                                                                                             | per 4 miles, " 9d. to 1s. "         |
| Ditto by ditto in Canal .....                                                                                                  | " " 1s. "                           |
| and the Canal dues extra.                                                                                                      |                                     |

Caen Stone is frequently used in the Colonies.

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COPY OF TRANSLATIONS OF FRENCH CERTIFICATES BY  
APPOINTED ARCHITECTS OF FALAISE,  
IN THE DEPARTMENT OF CALVADOS, NORMANDY.

"I, the undersigned Architect of Falaise, Department of Calvados, Certify that most of the Monuments, Edifices, and houses of particular note of this town and its environs, are built of the stone coming from Aubigny, and that they are in an excellent state of preservation."

Falaise, 1st August, 1849,

LEVERASSEUR.

"Seen for the legalization of the Signature of Mons.  
Leverasseur, Architect of Falaise."

Falaise, 2nd August, 1849,

MAYOR, C. H. HABBE.

"The Architect of the town of Falaise, Certifies that most of the Public Edifices of the town are built of the hard stone of Aubigny, he also Certifies, that other buildings where it has been used, are to this day in an excellent state of preservation."

Made at Falaise, 1st August, 1849,

(Signed) A. VROLOUGE.

"Seen for the legalization of the Signature of "Vrolouge,"  
The Mayor of Falaise,  
CH. HABBE.

COPY OF REPORT RELATIVE TO AUBIGNY STONE BY  
C. H. SMITH, ESQ., ONE OF THE COMMISSIONERS  
FOR THE SELECTION OF STONE FOR THE ERECTION OF  
NEW HOUSES OF PARLIAMENT.

Aubigny Stone will be found an excellent material for Architectural works, where its hardness will not be considered an insurmountable objection; I am not prepared to offer positive evidence as to its durability, evincible from old buildings in the neighbourhood of the quarries, as great part of the Castle, and most of the elaborately carved Churches at Falaise, are built with a softer stone. However, although the walls which surround the Castle buildings are comparatively modern, yet they are of considerable age, probably of 100 years, and the coping stones are to all appearance from the Aubigny quarries. They are covered with lichens and other vegetable matter, which completely hide the natural colour of the stone, but on attentive examination, the Arrieses, Angles, Joints, Toolmarks, &c., are all as perfect as when fresh from the workman's hand; as evidence to this statement, I send you a small fragment from the Coping, which I brought from Falaise a few months since—I have no doubt whatever of it being Aubigny stone. By reference to the tables in the Builder, No. 314, Feb. 11th, 1849, it will be found, that among all the specimens from Caen and its vicinity, Aubigny Stone is the heaviest, that is, it has the greatest specific gravity, possesses the greatest cohesive strength, a power to resist crushing, and absorbs the least quantity of water; amongst stones of the same mineralogical character, these qualities are generally favourable to durability.

I have taken this opportunity of remarking that all kinds of Caen Stone possesses the inherent power of hardening, after being removed from the quarry, and exposed to the Atmosphere, more than any other stone that has come under my notice.

C. H. SMITH.

29, Clipstone Street, Fitzroy Square,  
London, September 13th, 1849.

REMARKS

ON

CAEN & AUBIGNY STONE.

BY

LUARD, BEEDHAM, & COMPANY,

QUARRY PROPRIETORS AND IMPORTERS;

ALSO,

EXTRACTS FROM PAPERS AND REPORTS,

BY

PROFESSOR T. L. DONALDSON; G. GODWIN, Esq., F.R.S.;

AND C. H. SMITH, Esq.,

A MEMBER OF THE COMMISSION APPOINTED BY THE GOVERNMENT TO SELECT  
THE STONE OF WHICH TO BUILD THE NEW HOUSES OF PARLIAMENT:

TO WHICH IS ADDED,

A DESCRIPTION OF THE VARIOUS BEDS OF CAEN STONE,

SUITABLE FOR EXTERNAL AND INTERNAL WORKS.

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London:

PRINTED FOR LUARD, BEEDHAM & Co.,

(FOR PRIVATE CIRCULATION.)

May, 1851.



1878 & 1879

THE SHAW PRINTING & CO. CO.

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THE SHAW PRINTING & CO. CO.

LUARD, BEEDHAM, AND COMPANY are induced to issue a second but reduced edition of their small work upon Caen and Aubigny Stone, with such corrections as further experience in selection of the Quarry beds have suggested; they beg also to inform their readers, they have greatly compressed the extracts from the papers published in the "Builder," page 442, of 1848 and 1849, also the reports, tables, and certificates upon other stones, from foreign Architects, &c., that attention may be more directly called to the subject of enquiry, "Caen Stone;" and in so doing, they embrace the opportunity of expressing their satisfaction of the result of their efforts to facilitate the extended use of the above stones, for architectural and ornamental purposes, and to present their respectful acknowledgements for the patronage vouchsafed by the Professional and Building classes. They beg to assure those who may confide their orders to them, that unremitting attention shall be paid to their commands, and the utmost care bestowed in the production of good Caen stone, of such quality as will ensure safety from the effects of the atmosphere, and other causes of damage; they beg to suggest to those who may intend to use Caen stone; to consult the following pages for information, to facilitate the right use of it, and to add thereto, the assistance of men whose knowledge is derived from practical experience, in its working and appropriation to the building in which it is to be used, as experience only is the safeguard in selecting at the wharf or quarry.

CAEN SUFFERANCE WHARF,

179, Rotherhithe Street, London.

May 27th, 1851.

See Extracts and Notes for the various descriptions of Caen and Aubigny Stone, their uses, &c., as given in the Margin of the Work.

# SECTION OF ALLEMAGNE QUARRIES, CAEN, NORMANDY.

|                                                                              |            |                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Uppermost Courses of hard, coarse Stone and Rubble.                          |            | This is used for rubble walling and road work.                                                                                                                                                                                                                                                                                                 |
| BANC CLOUTIER,<br><i>Top Bed.</i>                                            | 2:0        | This bed of stone is not imported in England, being hard, coarse, and pebbly but is used for rough walling at Caen, &c.                                                                                                                                                                                                                        |
| BANC POURRI,<br><i>Pebbly Bed.</i>                                           | 3:0        | L. B. & Co. do not now generally import this bed, it having patches of white marble in it, which surrounds the pebbles and speedily decays, leaving an indent in the surface of the stone.                                                                                                                                                     |
| GROS BANC,<br>Banqueret.<br><i>Great Bed.</i><br>Sometimes divided into two. | 6:0        | Color, a rich cream tint. A serviceable stone, fit for general purposes of embellishment and ordinary construction of edifices either external or internal, plain ashles chimney pieces, large ornamental work, &c.                                                                                                                            |
| LA PIERRE FRANCHE,<br><i>Free Stone Bed.</i>                                 | 3:0        | Color, a fine clear cream; similar to the finest Combedown Bath ground stone for durable qualities, suitable for weather projections, and exposure in the upper part of building, cills, copings, cornices, &c.                                                                                                                                |
| BANC DE 4 PIEDS,<br><i>Fine 4 feet Bed.</i>                                  | 4:0        | A fine mellow clear color, very close grain, easy to be worked by the Sculptor and Mason, securing to the former full credit for his artistic skill.                                                                                                                                                                                           |
| PIERRE DE 30 POUCES,<br><i>Hard 30 inch Bed.</i>                             | 2:0        | Similar to the Gros Banc in color and quality, and suitable for general work.                                                                                                                                                                                                                                                                  |
| FRANC BANC,<br><i>Soft Bed.—Free Stone.</i>                                  | 4:0 to 5:0 | This bed is now left unquarried, by L. B. & Co., being considered unfit for external work, as it speedily decays by the action of the atmosphere. It is of varied color, in large patches of deep tints, yellow, slate and white, with two layers of hard texture, adjoined by the softer part which decays; suitable only for internal works. |
| This Bed is divided into two thicknesses.                                    | 1:8 to 2:0 |                                                                                                                                                                                                                                                                                                                                                |

\*For general description of beds, see page 10, by Messrs. DONALDSON, GODWIN, and SMITH.



## REMARKS

ON

### CAEN AND AUBIGNY STONE.

THE following pages are necessary, from the growing interest in reference to Caen Stone as a Material for the Masonic construction and Architectural embellishment of public edifices, whether churches, chapels, institutions, the mansions of the nobility and gentry, or the more varied structures of the middle classes; and especially the question of which all Free Stones are the subject, viz.: their qualities for resisting, or otherwise, the effects of the atmosphere of this country, and more particularly of London. It is generally known, that until 1847, no efforts were made to settle this point, or remove the risk involved in the use of free stones: and at the present, too little regard is paid to this important subject, by the quarry-master, the builder, and in some cases by the members of the profession. It has, however, become a matter of some concern with those who are interested in Caen Stone, to see that it is selected from approved beds, suitable for all purposes, thereby providing a guarantee for the safety of its use for building generally, and removing doubt from the minds of those who desire to use it, but have hitherto been discouraged.

Introductory  
remarks.

The Extracts contained in the following pages, are respectfully recommended to attentive perusal, having been made from papers, written by gentlemen who have made themselves masters of the subject by their investigations, whose interests are not of a personal character, as are those of the quarryman and merchant.

L. B. & Co.  
have made extracts from  
papers read to  
the Members  
of the Royal  
Institute of  
British Architects.

LUARD, BEEDHAM, AND COMPANY, proprietors of Caen and Aubigny stone quarries, acknowledge the importance of the suggestions made some time since by Professor T. L. Donaldson, Esq., F.R.S., and C. H. Smith, Esq., (a member of the Commission appointed by the Government for the selection of stone for the erection of the new Houses of Parliament,) each of whom has made inspection and enquiry at Caen and the quarries, into the character and qualities of Caen, Aubigny, and Ranville stone; the mode of quarrying, and the system now adopted by quarrymen of selecting and exporting the same to this country, from whose

reports, (which were read before the Royal Institute of British Architects, and from which, by kind permission) they have made extracts, and now beg consecutively to lay them before the Archaeological and Architectural profession, the Building community and the public; assuring all who may be interested in their use of their earnest desire to meet the increasing demands for Caen and Aubigny stone of the *best quality*.

Efforts made  
to improve the  
character of  
Caen stone

L. B. & Co. are solicitous to merit a continuance of that confidence so long enjoyed by them; for which purpose they have, and are devoting their efforts to produce stone of such quality and from the same beds as will correspond with that used in the construction of ecclesiastical edifices of the middle ages, as seen at Caen, and in some parts of this country, whose present condition so strongly recommend them to the admiration of all that view them; and beg to express their best thanks to those gentlemen, from whose papers much valuable information has been obtained, and in confirmation of the necessity of selecting the best beds, they state, that in 1847, they arranged the plan of *selecting* the blocks from the four centre beds for *external* work, as recommended to the Institute of Royal British Architects. To secure this object, a member of the firm (who managed the English department of their trade,) removed to Caen, that by his supervision error should not be made in the *selection* of suitable stone.

L. B. & Co.  
do not quarry  
the bottom  
beds.

L. B. & Co. are not quarrying those beds which produce internal stone. The importance of securing a material for the embellishment of our public buildings and splendid mansions, and for all architectural works, is now taking a greater hold of the professional and public mind of this country; and only by a hearty co-operation with Architects and Builders can success be secured in this object.\*

Buildings  
erected of Caen  
stone.

The buildings erected of Caen stone are too numerous to be given in detail; a few may however be noted which have been supplied before the question was raised as to the important matter under consideration. They trust that all quarrymen will be alive to the importance of *selection* of good stone of the various beds for their proper uses. It is not now the great question whether Caen stone is suitable for the English atmosphere, or for general architectural embellishment; these points have been decided by the increasing

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\*It is to be regretted that the system of selection at the quarries is not more generally adopted, and required by those who specify its use in contracts for carrying out their plans and designs for public and other edifices; it being evident that good durable stone can be secured by such means.



demands for its adoption ; nor is it by which merchant's house the stone has been supplied, but the beds from which it has been, or is to be, extracted in the quarries. Large sums of money have been expended in the erection of machinery and other apparatus, by those principally engaged in quarrying and exporting Caen stone, who feel it their highest interest, to conserve the character it has sustained, and remove every obstacle to its general use.

L. B. & Co. beg to suggest that the beauty of color, fineness of texture, and economy of labour, with the reduced rate of original cost, place Caen and Aubigny stone in fair competition with any material known in the metropolitan and provincial markets of the United Kingdom, access to which may now be secured by railway, river, or canal transit, at moderate charges and immediate delivery.

Samples of Caen and Aubigny stone of the 11th, 12th, and 16th centuries, may be seen at the offices of L. B. & Co., in a state of good preservation, as exhibited at the Crystal Palace, Class 1, No. 170.

The labor upon Caen stone is about the same as upon Bath, (if taken in its general working and put in fair comparison with the best weather beds of approved Bath quarries, and the high finish the former bears,) about half that of Portland, or Anston, or of sand or grit stones, as may be learnt from most of our modern Price Books, and from men of experience and character.

For the information of persons desirous of purchasing, or using Caen stone, L. B. & Co. beg to state that the best selected blocks for external work are of an uniform cream color, homogeneous in texture,\* of improved size and shape, and of much easier working than the *bottom* beds, which are generally of varied color, some parts exhibiting yellow, rusty, and dark tints, and of heterogeneous texture, rendering them more expensive to work by the mason or sculptor, and thereby making the cost as great or greater than external stone to the purchaser. These blocks are extracted from the lower beds of the rock, and may be easily discerned when first quarried, but not so when dry ; to distinguish the internal stone, the blocks are marked with a + under the number

put upon the same, such as

|         |
|---------|
| 2 0 0 0 |
| +       |

and the word inside is some-

times painted on *the side* of it. The natural bed of every block may be certainly known by the figures or numbers recorded on them,

The question is not who has supplied the stone, but of what quality it is.

Samples to be seen of Caen and Aubigny.

Characteristics of good Caen stone.

Ditto of internal stone.

How to know from which bed the block was quarried.

\*See section of quarries page 4.



Price of Caen  
stone,

as

|         |   |   |   |
|---------|---|---|---|
| 1       | 6 | 4 | 9 |
| bottom. |   |   |   |

The price of Caen stone varies according to circumstances, of delivery, &c., from 1s. 2d. to 1s. 3d. per foot cube.\*

The cost of delivery by railway may be calculated at 1d. per ton for each mile, to 1½d., according to distance.

Method of  
quarrying and  
seasoning.

The process of quarrying is generally conducted by experienced men, and carried on throughout the year; that extracted from the rock in the winter remains in the quarry until the following spring, by which a gradual emission of quarry damp is effected, and the stone thereby rendered fit for immediate shipment; it is more easy and economical to convert under the chisel of the artist and workmen in this state than when hastily dried by the wind and sun. As many just complaints have been made of the irregular shape of the blocks, the present improved system of quarrying and handicraft has been adopted, by which blocks of better shape will be produced, effecting a saving to the consumer and purchaser.

Vents in block,  
how removed.

Caen, like all other free stone, is subject to natural vents; the blocks, prior to shipment, are therefore examined, and if venty, are reduced by the saw in the direction of the vents, thereby avoiding waste to the contractor.

Caen stone &  
Aubigny used  
in connection  
with each other

Caen stone may be very appropriately used in connection with Aubigny, the first for the general works of superstructure, the latter for all basement, weather and other projections, where exposed to alternate influences of wet and dry,—for plinths, landings and steps of staircases, balconies, kirbs and piers for iron palisading, and small columns to carry groins, arches, &c., it being in harmony with Caen, for color and texture.

For many centuries Caen stone has been largely used as a building stone, and is now in high preservation in many of our ancient and modern buildings—many of the old churches and edifices in the southern parts of England, and most of those in the northern parts of Normandy; the interior of the new Houses of Parliament, in which are constructed some of the finest groins and emboss in the kingdom, under the supervision of C. Barry, Esq., Architect; Buckingham Palace; Officers' quarters, east wing of the new additions to the Tower of London; Carlton, Conservative

\*The price and facilities of working Caen stone has induced a more general use of it instead of cement, in many of our public and private buildings, much to the satisfaction of proprietors and architects.

Army and Navy Club Houses;† the late additions to the south east wing of the Temple; several mansions of celebrity, (as that of H. T. Hope, Esq. M.P., Piccadilly,) Redcliff Church, Bristol; the Brighton College; the large Ouse Viaduct on the London and Brighton Railway; Chichester, Exeter, and Canterbury Cathedrals; also the New City Prison, Holloway, London, and many scores of churches, chapels, public institutions, and other buildings, in England, Ireland, Scotland, New Brunswick, the Colonies, and on the Continent, supplied by various parties.‡

Buildings where Caen stone has been used.

L. B. & Co. are prepared to supply any quantity of the *best-selected Caen Stone*, of dimensions from 1 to 8 tons, and by special order from 8 to 10 tons; rough Ashlar, varying from 4 to 8 inches in thickness, from face, and from 6 to 10 inches in course, by appropriate lengths,—this would be found a good substitute for the Kentish Hossock stone, for inside facing, avoiding the modern and expensive system of plastering. Caen stone can be conveyed to any port or place, metropolitan or provincial, in the United Kingdom or its dependencies; L. B. & Co. prefer executing orders after inspection has been made by the architect or contractor at the quarries or wharf, thenceforth under the supervision of competent persons, during the progress of the supply, and the execution of the works; by these means suitable sizes can be generally obtained.

Size of the blocks of Caen stone.

The appointment of a competent judge, in all cases of public importance and magnitude, would be the most effectual and the only certain mode of checking the importation of Caen stone inappropriate for external works to this country, whose care it would be to examine before using it.

Appointment of an inspector.

“The material generally known to us under the appellation of Caen stone is of the oolitic formation, presenting a close analogy in its general, and even in some of its minor divisions, with the rocks of similar kind in the south of England. The quarries whence it is derived are situated at Allemagne, a parish and village on the right bank of the river, at the distance of about a mile and a half, or two miles above the city of Caen.”

Caen stone an oolite.

Allemagne stone quarries.

“Immediately under the soil there are some thin courses of hard coarse stone and rubble, but the immediate ceiling-bed is called the

Names of beds in the quarries.

† The Army and Navy Club House is referred to as selected stone, by L. B. & Co., who are willing to stipulate that their supplies shall not be inferior to that.

‡ The need of care in selecting is manifest in some of the buildings enumerated, where the effects of the atmosphere is already manifest.

\* Extract from Professor DONALDSON's paper, see "Builder."



Banc Cloutier, or Enclosing Bed, Banc Cloutier (*enclosing bed*), and is about 2 feet 6 inches thick. It is of a hardish quality, but it is not applicable for building purposes, as it contains a great quantity of pebbles, which offer great difficulties in the sawing and working. There are about six beds\* of good building stone, the five uppermost ones calculated for outside work, the lowermost adapted only for inside work, as it has soft portions, which do not well resist the atmosphere; much of this is used in the interior of the new Parliament buildings. The aggregate height of these six beds is from 22 to 26 feet. It is to be observed that all these beds are not to be found in every quarry, one or other of them disappearing and re-appearing in the same manner as in England. The names which I am about to give do not obtain in all parts of the district; and some of them have various designations given to them by the quarrymen. The uppermost bed is called the Banc Pourri (*pebbly bed*), about 3 feet thick, which is a very good quality of stone; but occasionally it has in some portions the hard pebbles, previously alluded to, as prevailing to so great a degree in the Banc Cloutier (*enclosing bed*), and therefore it is not so much esteemed for finer building purposes as the lower beds. The Gros Banc (*great bed*) is the next bed, and has an average depth of 5 feet; but as it is inconvenient to work to that large size, it is generally split into two, in heights of 3 feet and 2 feet; and the smaller one is called the *small bed* of the *great bed*. The Pierre Franche (*free stone bed*) comes next, about 3 feet deep, which is of a harder quality, and well adapted for cornices, sills, copings, and the like exposed positions in a building. Next to this is the Banc de 4 Pieds (*bed of four feet*), a very fine bed, which has the same appellation, and depth of 4 feet in all the quarries, as also the next bed, called the Pierre de 30 Pouces (*thirty-inch bed*), being 30 inches deep, a good hard bed of stone, and forming the lowest of those fit for outside purposes and exposure to the weather. The sixth and lowermost bed of the building stone is termed the Franc Banc (*free bed*), and has a total depth of 4 feet 6 inches to 5 feet; but this being, like that of the Gros Banc, an inconvenient depth, it is divided into the lower thickness of 3 feet, and an upper *small bed* of 20 or 24 inches deep.† The whole of the stone of these beds is soft and tender in the quarries, and the blocks are extracted with great ease. They are produced of regular size and square-

\*L. B. & Co are quarrying from the 4 middle beds, as being most fit for external works and suitable for our climate.

† See section of quarries, page 4.



ness. When taken to the outside, and exposed to the atmosphere, they gradually part with much of their humidity, and harden; and if exposed on the quays during the winter, they are covered over to protect them from the frost. They saw freely with a common peg-toothed saw, without either sand or water, and are easily worked for building purposes; and, being of a compact fine grain, they produce very sharp arrises, and receive a very smooth surface on the face.

Mode of seasoning and sawing at the quarries.

\*“The general character given of the Caen stone is, that all the beds are of the same quality, and all equally adapted for building purposes; but evidently, from the information which I collected on the spot, and subsequently in London, from Messrs. Luard, there are modifications in each bed, as may be reasonably supposed, and as experience teaches us in the quarries of other oolitic stones in Bath and Portland. Various veins traverse the beds in all directions, and have a white appearance; this white substance is equally hard with the stone itself, and if a stone be laid with its bed parallel with the direction of these veins, it is of little consequence, but they, of course, indicate a certain unsoundness or division in that part; and if the stone be laid with this vein in a vertical direction, the block will run the chance of being fractured by a weight, or, if near the surface, it probably may admit the wet. These veins are not like those in the Bath stones, which are hard, consisting of crystallized carbonate of lime, and running always in a vertical or inclined direction, and not liable to separation. In general, it is considered that the blocks of Caen stone may be placed in construction in any direction, except when the white veins are perceptible. It is said that the most experienced eye can hardly detect the different qualities of the stone in the block, when once they have been removed from the quarry,† as the action of the quarryman’s tool on the surface hardly offers any indication, and there is no appreciable difference in the appearance of the granular formation.

General character of Caen stone.

Veins, &c. in blocks, and the bed of the same.

Bath stone veins not like those in Caen stone.

“Up to a very recent period the stone from the various beds has been sent into the market, by all parties, used indiscriminately, a fact which is thought to account for the decay which is now observable in various quarters. Caen stone does not differ in this respect from the oolites in our own country: the bottom beds

Indiscriminate use of Caen stone, and its effects.

\*Remarks by G. GODWIN, Esq. on Caen and Aubigny stone.

† Experience enables practical Masons and Artists to judge with tolerable certainty of the quality in the block, by the color and quarry tool marks.

of the Bath quarries and Portland quarries, for example, are soft and much less durable than the top beds.

L. B. & Co.'s mode of indicating internal bed.

Selection of beds, and how performed, with the mode of numbering the blocks.

Selection not general with the quarrymen and merchants.

Aubigny stone introduced by Luard & Co. to England.

Birth-place of William the Conqueror near the quarries of Aubigny stone.

"Of late, one of the Caen Houses, (Messrs. Luard, Beedham and Co.), becoming satisfied that the bottom bed is not fit for outside work, profess to mark with a cross every block which comes from it, so that these may be used in parts not exposed to the effects of weather, and we are disposed, after enquiry, to believe their profession.\* They further number each block on the upright side of it as it stands in the quarry, so as to show with certainty the way of its bed. If builders, to save labour or through carelessness, will nevertheless, use the 'bad' bed externally, the culpability of course rests with them, and the reputation of the stone is risked in spite of any precaution which may be taken to prevent it.

"We did not find that the other merchants profess to distinguish the blocks of the bottom bed from those of the upper. One of the principal of them, who although he would not admit that the first bed gave the worst stone, still called it in conversation the 'bad' bed, said, 'if I distinguish this, I shall have to keep it back, and what can I do with it? When dry, the stone looks all alike, and I defy any person then to tell one bed from another.' This is true enough; but which bed will *last* the longer, and what is the wise course for those to adopt who are really interested in maintaining a good reputation for the stone, is quite another question.

"In fulfilment of a promise made in the course of our recent papers on the building stone of Caen and its neighbourhood, we proceed to notice the Aubigny quarries, which furnish a stone that is now being introduced to the English Market, chiefly by the efforts of Messrs. Luard, Beedham, & Co., who have under their control the principal quarries: it bids fair to be much used. These quarries are at a place called *St. Pierre, Canivet*, close to the town of

#### FALAISE,

which is about twenty-two miles to the south-east of Caen, and is world-famous as the birth-place of the energetic William, surnamed 'the Conqueror.' At Aubigny, which gives name to the stone, and is at a short distance from Falaise, nearer to Caen, no quarries are now worked.

\*Some portions of the best beds are less durable than others, those blocks are reserved for internal works, and marked with a + on the side.



## AUBIGNY STONE.\*

Tradition says that the quarries have been worked for a long period of time; and the appearances of the neighbourhood, the large masses of *debris* to be seen in various quarters, seem to justify the belief. The quarries are each approached by an inclined cutting of considerable size, the expense of forming which is great, as it descends to a depth of about 35 feet. The height from the surface of the ground to the ceiling of the quarry we first entered, is 20 feet; and from the ceiling to the floor of the quarry, 9 feet. In this height of 9 feet there are only two beds of workable hard stone; the upper one averaging 2 feet in thickness, and the lower one 15 inches. Between these is a stratum of soft stone. The beds under are thin, about 9 inches in height, and contain shells, so that they could not be profitably worked.

"The beds are nearly level, and the joints run north and south. To get out the stone the men need make no horizontal cuts, but simply have to clear away the soft beds. This produces a large amount of waste; but much of the soft stone is used in the neighbourhood, *because* it is soft, not merely for mangers, steps, &c., in which shape it is prepared by the quarrymen in their more leisure time, but for the dressings of buildings. The lengths of the blocks is regulated to some extent by the fissures which prevail; the width of them is about 3 feet. When we were in the quarry they were removing some stones, 10 feet in length; the largest ever taken out and sent away, was 17 feet long.

Size of the blocks.

"Strong pillars of the stone, 9 feet square, are left in the quarry 21 feet apart, to carry the ceiling, under the direction of a public inspector, as at Caen.

"The Aubigny stone is probably of the same nature as Caen stone, namely, oolitic, but much more crystalline, and now shows no appearance of *ovæ*. It is very fine grained, as hard or harder than Anston stone, and the crystals are semi-transparent. It is as heavy as granite, and is sawed wet, with sand. According to the statement on the spot, a man can saw about 7 feet superficial in the day, but in taking this as a datum to estimate the probable cost of labour upon it, it must be remembered, that neither the sand nor the saw used is of the best description.

Natural formation of Aubigny stone

\*Aubigny stone is now generally known and appreciated for its fine texture and color, and is being used for sculptural purposes and architectural embellishments.



Price of  
Aubigny in  
London.

"The price in London is something under 2s. a foot cube. We understand it is now being used in a new church at Leeds, and in the construction of a lighthouse (in conjunction with Caen stone), at Honfleur. At the Chateau d'Eu, the residence of the late king of the French, it is said to have been extensively employed."

The upper beds  
of the quarries  
the best stone  
for building.

"It seems to be the general opinion of the proprietors of quarries, and their quarrymen, as well as of the masons and builders at Caen, that the most durable stone is obtained from the uppermost of the six workable beds, or from those beds which are nearest to the top, and freest from the little pebbly concretions which abound in the ceiling bed; and also that the lowest beds are softer, and thereby more readily disintegrated by exposure to the weather. I feel disposed to pay attention to this statement, because it corresponds with practical observations and opinions entertained by most people who are well acquainted with quarrying and working stone of a similar mineralogical character in our own country. The top beds of Portland, Bath, Ketton, and other oolitic limestones, are all the most durable; whereas the undermost strata in the same quarries are well known to moulder away, if exposed to moisture and the usual atmospheric influences.

Bottom beds  
of Portland,  
Bath, & Ketton  
quarries is bad  
stone.

Alterations of  
weather most  
trying to stone.

"Of all the causes of decay in stone, none is more destructive than variations of temperature; the vicissitudes of heat and cold, dryness and moisture, frequently alternating, are more ruinous to the carved parts of a building than either of these extremes constantly operating. However slight the additional heat may be to which a body is subjected, it will expand under its influence, and contract when the temperature is lowered. The thermometer will probably vary 100 degrees from the severe frost of a winter night to the direct rays of an afternoon summer sun, which never shines upon the north or south-east sides of building, except very obliquely at rising and setting; but the south and west fronts have the same degree of heat and cold as the north and east during the night, with the additional warmth of meridian splendour daily. Such extremes must tend to loosen the component parts, and thereby separate many small fragments from the surface of stones, especially if the mass is made up of different substances, in which case some will expand and contract more, in proportion to their size and density, than others. The test of time proves this to be correct, for in all cases, the greatest amount of disintegration has taken place, where the inequalities of temperature are greatest.

"Much stress is generally laid upon Caen stone being 'well  
\*Remarks by C. H. SMITH, Esq. on the uses of Caen stone and causes of decay.

seasoned: although this caution is important to a certain extent, it is usually overrated. All kinds of stone while in the rock, or when recently quarried, are more thoroughly saturated with moisture than can ever be accomplished after they have been once allowed to get dry. If the stone be remarkably soft, it is advisable not to let it dry too fast after it has been taken from the quarry, for fear of its cracking, in consequence of the moisture being removed from the outside before that in the interior of the block can have had time to evaporate: hence, while the central part remains of its original size, and extremely damp, the surface will dry and shrink, thereby causing many unobserved cracks, the effects of which will be evident in the following winter. The Caen stone merchants take no other care of the blocks after they are exposed for sale, or shipment, on the quay, than to cover them with matting during frosty weather. In addition to this, I would recommend placing them under an open shed, where they might have a free current of air, protection from rain, and be shaded from the sun, which might otherwise cause them to dry too rapidly on the surface.

Seasoned Caen stone and its advantages.

Mode of drying and seasoning Caen stone at the quarries.

"The cost of Caen stone buildings, compared with works constructed of materials produced in this country, will, in a great degree, depend upon locality and other circumstances. At this time Caen stone may be delivered on a Wharf in London, for about two-thirds the price of Portland; and, for labour alone, the expense is certainly not more than half that upon Portland stone, or of that which is now being used at the New houses of Parliament. Although elaborate architectural works may be constructed in that beautiful material, for a comparatively small sum, I wish it to be clearly understood that the material now generally known in the markets as Caen stone differs, in many essential particulars, from the stone which forms the exterior of the venerable edifices which have adorned the city of Caen from the period of William the Conqueror until this time. It is too much to expect that the palace of our Sovereign, the mansions of the wealthy, and the palatial-looking club-houses, which have recently been constructed with Caen stone in the metropolis of England, should endure for seven or eight centuries, with as little appearance of decay as is at this time observable on the sacred structures in the vicinity of the quarries. However, if good judgment be exercised in selection, it is probable that the buildings now erecting with Caen stone in this country may continue in a fair state of preservation for at least one or two centuries."

Cost of Caen stone buildings compared with Portland.

Duration of Caen stone buildings.



"Aubigny stone will be found an excellent material for Architectural works, where its hardness will not be considered an insurmountable objection; I am not prepared to offer positive evidence as to its durability, evincible from old buildings in the neighbourhood of the quarries, as great part of the Castle, and most of the elaborately-carved Churches of Falaise, are built with softer stone. However, although the walls which surround the Castle buildings are comparatively modern, yet they are to all appearance from the Aubigny quarries. They are covered with lichens and other vegetable matter, which completely hide the natural color of the stone; but on attentive examination, the arrises, angles, joints, toolmarks, &c., are all as perfect as when fresh from the workman's hand; as evidence to this statement I send you a small fragment from the coping, which I brought from Falaise a few months since—I have no doubt whatever of it being Aubigny stone. By reference to the tables in 'The Builder,' No. 314, Feb. 11th, 1849, it will be found, that among all the specimens from Caen and its vicinity, Aubigny Stone is the heaviest, that is, it has the greatest specific gravity, possesses the greatest cohesive strength, a power to resist crushing, and absorbs the least quantity of water; amongst stones of the same mineralogical character, these qualities are generally favourable to durability."

#### EXPERIMENTS ON CAEN, AUBIGNY, RANVILLE, AND OTHER STONES.

TABLE A.—*Chemical Analysis.*

|                   | Maladerie. | Gros Banc. | Banc de 4 Pieds. | Aubigny. | Outside of St. Stephen's Chapel, Westminster. |
|-------------------|------------|------------|------------------|----------|-----------------------------------------------|
| Carbonate of lime | 88.15      | 86.5       | 86.9             | 97.60    | 97.3                                          |
| Silica            | 7.80       | 10.5       | 10.5             | ....     | 2.0                                           |
| Alumina           | 2.14       | 3.0        | 2.2              | .14      | 0.7                                           |
| Oxide of Iron     | ....       | A trace    | 0.4              | A trace  | A very slight trace.                          |
| Magnesia          | 1.03       | A trace    | A trace          | .84      | ....                                          |
| Organic matter    | .83        | ....       | ....             | .70      | ....                                          |
| Moisture and loss |            |            |                  | .42      |                                               |

R. PHILLIPS, F.R.S.

TABLE B.—*Weight of 6-inch Cubes.*

|                     | Ordinary State. |     |     | Thoroughly wet. |     |     | Thoroughly dry. |     |     | Weight absorbed. |     |     |
|---------------------|-----------------|-----|-----|-----------------|-----|-----|-----------------|-----|-----|------------------|-----|-----|
|                     | lbs.            | oz. | dr. | lbs.            | oz. | dr. | lbs.            | oz. | dr. | lbs.             | oz. | dr. |
| Maladerie           | 16              | 0   | 12  | 17              | 6   | 2   | 15              | 14  | 10  | 1                | 7   | 8   |
| Gros Banc           | 15              | 4   | 1   | 16              | 14  | 9   | 15              | 2   | 10  | 1                | 11  | 15  |
| Pierre Franche      | 15              | 8   | 6   | 17              | 2   | 5   | 15              | 7   | 0   | 1                | 11  | 5   |
| Banc de 4 Pieds     | 14              | 12  | 1   | 16              | 7   | 14  | 14              | 10  | 1   | 1                | 13  | 13  |
| Pierre de 30 pouces | 16              | 0   | 10  | 17              | 10  | 7   | 15              | 15  | 7   | 1                | 11  | 0   |
| Franc Banc          | 14              | 8   | 4   | 16              | 5   | 14  | 14              | 5   | 12  | 2                | 0   | 2   |
| Ranville            | 17              | 12  | 12  | 18              | 10  | 5   | 17              | 12  | 5   | 0                | 14  | 0   |
| Aubigny             | 18              | 13  | 14  | 19              | 7   | 12  | 18              | 12  | 13  | 0                | 10  | 14  |

C. H. SMITH



GLASS PIPES WITH PATENT JOINTS,

FOR THE CONVEYANCE OF

PURE WATER,

AS SUGGESTED IN THE SPEECH OF

THE LATE SIR ROBERT PEEL  
ON THE ABOLITION OF THE GLASS DUTIES

IN FEBRUARY, 1845.

AND

PATENT SYPHON VASES

FOR CONTAINING

AERATED MINERAL WATERS

—+\*+\*+—

MAYO & CO.

PATENTEES,

17, SILVER STREET, WOOD STREET, CHEAPSIDE

LONDON.



EXHIBITED

AT THE

CRYSTAL PALACE,

1851.

CLASS I. No. 399.

AND

CLASS 27. No. 8.

**En Pierres**

*(Le seule en ce genre)*

Comprend tout le monde et pour toutes machines et appareils mandes toujours croi Messrs. les et des Machines les qu' ils n' ont probal Requisite de la dei Expose a la Grand Matériaux naturels

**EINE**

LONDON.

WERK WUERDIGKEIT

Etablissement

Das hernehnte

Genue Turkey Oistone

DE LONDRE

AS SUGGESTED BY  
THE LATE SIR ROBERT PEELE,  
ON THE ABOLITION OF THE GLASS DUTIES

IN FEBRUARY, 1845.

Glass Pipes can be laid down with great facility, and altered, extended, or removed at pleasure; the same joints being available for any length of time, without communicating the slightest metallic impregnation to the water or other fluids passing through the pipes;

THEY ARE CONNECTED BY MEANS OF  
**MAYO'S PATENT JOINT,**

AND ARE

Manufactured by Messrs. R. W. SWINBURNE & Co.  
OF SOUTH SHIELDS, NEWCASTLE, AND  
93, UPPER THAMES STREET, LONDON,  
UNDER A LICENSE FROM

**MAYO & CO.**

MANUFACTURERS OF MINERAL WATERS,  
17, SILVER STREET, WOOD STREET, CHEAPSIDE,  
LONDON.

THE GLASS PIPES AND PATENT JOINTS HAVE BEEN  
PROVED UNDER HYDRAULIC PRESSURE OF  
600 lb. ON THE SQUARE INCH.

The Price would not exceed the Cost of Lead Piping.



THESE VASES ARE PARTICULARLY ADAPTED  
FOR USE AT THE  
**REFRESHMENT TABLE,**

AT

**EVENING PARTIES,**

AND IN THE

**CHAMBER OF THE INVALID,**

They afford the means of withdrawing at pleasure such portions of the water as may be desired, whilst that which remains for subsequent use retains its purity and effervescence.

**SELTZER WATER, CARBONATED WATER,**

**POTASS WATER, and SODA WATER,**

MAY BE HAD IN THESE VESSELS OF

**MAYO & CO.**

THE PATENTEES AND

MANUFACTURERS OF MINERAL WATERS,  
17, SILVER STREET, WOOD STREET, CHEAPSIDE,  
LONDON.

R. PHILLIPS, D.

TABLE B.—Weight of 6-inch Cubes.

|                     | Ordinary State. |     |     | Thoroughly wet. |     |     | Thoroughly dry. |     |     | Weight |
|---------------------|-----------------|-----|-----|-----------------|-----|-----|-----------------|-----|-----|--------|
|                     | lbs.            | oz. | dr. | lbs.            | oz. | dr. | lbs.            | oz. | dr. |        |
| Maladerie           | 16              | 0   | 12  | 17              | 6   | 2   | 15              | 14  | 10  | 1      |
| Gros Banc           | 15              | 4   | 1   | 16              | 14  | 9   | 15              | 2   | 10  | 1      |
| Pierre Franche      | 15              | 8   | 6   | 17              | 2   | 5   | 15              | 7   | 0   | 1      |
| Banc de 4 Pieds     | 14              | 12  | 1   | 16              | 7   | 14  | 14              | 10  | 1   | 1      |
| Pierre de 30 ponces | 16              | 0   | 10  | 17              | 10  | 7   | 15              | 15  | 7   | 2      |
| Franc Banc          | 14              | 8   | 4   | 16              | 5   | 14  | 14              | 5   | 12  |        |
| Ranville            | 17              | 12  | 12  | 18              | 10  | 5   | 17              | 12  | 5   | 0      |
| Aubigny             | 18              | 12  | 14  | 19              | 7   | 12  | 18              | 12  | 13  | 0      |

C. H. S.



# For VISITORS to LONDON.

## THE CELEBRATED Hone, Oilstone & Grindstone Establishment, OF C. MEINIG,

*(The only of the Kind in England, and probably in the whole World.)*

Has been assorted for the Great Exhibition, with a vast stock of the most exquisite and choice Stones, Machines and Implements for all various uses in the mechanical arts, such as an experience of sixteen years and the constant demands of an advanced and highly developed Industry has brought within the reach of the Proprietor.

Strangers, visiting London, and who take an interest in procuring this highly important article of the best description existing, will find at this Establishment a great number of highly superior articles and requisites, many of which may be wholly unknown, or at least unattainable to them at home.

*Stall at the Exhibition of all Nations: English Department, Section 1st. (Materials) No 84, South-western part of the Building.*

Warehouse: 103, Leadenhall Street, City.

Works: Francis Place, Rotherhithe, London.  
WHOLESALE, RETAIL, EXPORT.

## UNE SPECIALITE' DE LONDRE.

### Un Etablissement celebre

de M. MEINIG,

En Pierres a' aiguiser, a' e'moudre, a' polir &c.

*(Le seule en ce genre en Angleterre et probablement dans le monde entier.)*

Comprend tout ce qu'il-y-a de plus excellent en pierres, choisies de toutes parties du monde et pour tous les usages varies d' une industrie avancee et etendue; de plus, les machines et appareils les plus perfectionnees, qu' une experience de seize ans, et les demandes toujours croissantes des ouvriers habiles ont mis a la portee du Proprietaire.

Messrs. les Etrangers, qui prennent un interet a se procurer des pierres exquises, et des Machines les plus avantageuses, trouveront dans cette maison beaucoup d' articles, qu' ils n' ont probablement jamais vues on connues auparavant.

*(Requisite de la derniere importance pour le perfectionnement des outils et du travail.) Expose a la Grande Exposition de tous les Nations: Departement Anglais, Section 1ere (Materiaux naturels) No. 84, (partie Sud-ouest de l' Edifice),*

Magazins: 103, Leadenhall Street, City.

Ateliers: Francis Place, Rotherhithe, Londre.

GROS, DETAIL ET POUR L' EXPORTATION.

## EINE MERKWUERDIGKEIT LONDONS.

Das berühmte Etablissement

von C. MEINIG,

In Schleif-, Wetz-und Polir-Steinen,

*(Das einzige dieser Art in England, und wahrscheinlich in der ganzen Welt.)*

Umfasst die angesuchtesten Sorten von Steinen aus allen Laendern der Erde und fuer alle verschiedene Zwecke der mechanischen Thaetigkeit; ferner die vortheilhaftesten Schleif Apparate und Maschinen, welche eine Erfahrung von Sechszehn Jahren und die stets sich steigende Forderungen einer ausgedehnten und hochentwickelten Industrie in den Bereich des Besitzers gebracht haben.

Die Herren Fremde, welche sich fur diesen, zur Vervollkommenung der Werkzeuge und der Arbeit so ueberaus wichtigen Artikel interessieren, werden bey diesem Hause eine grosse Menge Sachen und Huelfsmittel finden, die ihnen bisher wahrscheinlich gaenzlich unbekannt gewesen sind.

Ausgestellt in der grossen Ausstellng aller Nationen, Englische Abtheilung, Erste Section (Materialien) No. 84, Sued-westseite des Gebaues.

Lager: 103, Leadenhall Street, City.

Werkstaetten: Francis Place, Rotherhithe. London

EN GROS, EN DETAIL UND ZUR AUSFUHR,



A. B., Sections of Fans.—C., Discharge Pipe.—D., Iron Pipe to  
von C. MEINIG,  
Wetz und Polir-Steinen,

C. MEINIG

Wetz- und Polir-Steine

# C. MEINIG,

QUARRIER, IMPORTER AND DEALER IN

## HONES, OILSTONES, GRINDSTONES.

[PARTLY FROM HIS OWN QUARRIES.]

GRINDING & POLISHING MATERIALS, &c.

WAREHOUSE: 103, LEADENHALL STREET, CITY,  
WORKS: FRANCIS PLACE, ROTHERHITHE, LONDON.

A

Sharpening Stones for  
Tools.

Welsh Stone,

(Agency for the Green Rock Quarry.)

In **Hones**, Green Rock,.....

" " Grey ".....

**Gouge Slips**.....

**Currier's Blocks**.....

**Genuine Turkey Oilstone.**

Imported by C. M. direct, and cut at his Works.

In **Hones** assorted as to texture and hardness to facilitate the choice in the sale, and in various qualities, according to purity, uniformity, and dressing—  
No. 1 2 3 4

In **Gouge Slips**.....

**Sheep Shear do.**

**Square Pencils**

**Circular Turkey Stones**  
A great improvement for sharpening quickly, and producing a perfectly true facet.)

With centre holes for Spindles.....

Without centre holes for caps and chuck.....

**Frames for Circular Oil-**

**stones** with multiplying wheel

Vertical movement.....

Horizontal.....

**Turkey Stone Dust.** the

finest grinding material, warranted genuine and unmixed—

Coarse.....

Fine.....

**Persian Oilstone.**

(Imported by C. M. direct)

Cuts faster than Turkey Stone, and is of quite uniform and pure texture. The best Stone extant, for broad Tools—

In **Hones**.....

**Pencils**

**Circulars** with centre holes

Do without ditto.....

**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones**.....

**Pencils**

**Niagara Oilstone,**

(For Gravers.)

In **Hones**.....

Hard, coarser cut than Arkansas.

**Spanish Stone,**

Fast and fine cutting. Cheap and excellent Stone for Edge Tools.

In **Hones**, all sizes.....

**Charnley Forest Stone,**

In **Hones**, best.....

common.....

**Gouge Slips**.....

**Square** ".....

C

For Cutlery, &c.

Razor Hones—German  
(Old and new Rock)

**Penknife Size**  
**6½ to 7** inch.....

No 1, old yellow No 1, white

**7½** inch.....

No 2 No 3

No 5 common; No 4, good common

**7¾** inch No 1 1½ common

**8** to **8½** " " " "

**9** to **9½** " " " "

**10** to **10½** " " " "

**11** to **11½** " " " "

**12** to **12½** " " " "

**13** to **13½** " " " "

**14** to **15** " " " "

Thin all Yellow Slips for Mounting.

**4** inches No. 1, No. 1½

**4½** " " " "

**6** " " " "

**7½** " " " "

All Blue.

**7½** inch.....

**8** to **8½** inch.....

**9** to **10** ".....

The qualities No. 1, labelled with C. M.'s warrant for absolute perfectness, and with Show Cards, 2s. per dozen more.

**Italian Water Hones.**

(Imported by C. M.)

The best finishing Hones for Razors and Lancets, and admirably adapted for private use, with Show Cards for the Trade.

**Lancet Hones**, No 1—4 inches

" " 2—6 "

**Razor Hones** } with 3—8 "

" " } pub- 4—10 "

stone,

**Cutler's Sandstone Blocks,**

12 inches 15 inches 18 inches

**Meinig's Household Stones,**

For Table and Carving Knives,

A peculiar fine Bohemian Griststone, mounted on Wood, now in general use in almost every part of England.

No. 1,

2,

3,

Show Cards and Bills for the Trade.

**Ragstones**, Imported direct.

Raw, Half-dressed, Full-dressed



**Scythestones.**  
**Red Derby Bats,** 11 in. 12 in.  
**White** .....  
**Pillar,** smooth, chiselled,  
 plain, labelled, best labelled.  
**Talacre**  
**Bristol Bats** .....  
**Waterloo Pillars** .....  
**Scythe Sticks** .....  
**French Bile Scythe**  
**Stones,** for Gardeners.....

**Shoe Stones.**

**Common,** 9 inch 11 inch  
**French,** [Imported by C. M.] for Shoe-  
 makers, Bootbinders, Saddlers, Harness-  
 makers, Leather - Casemakers, Piano-  
 for-makers, Cork-cutters, &c. Very  
 superior. Mounted and unmounted —  
 No 1 2 3

*See Cords for the Trade.*

**D.**  
**CIRCULAR STONES.**

*In various Sizes.*  
**Newcastle Gritstone** ..  
**Yorkshire** " ..  
**Derbyshire** " ..  
**Bilston** " ..  
**Glasscutters** " ..  
**French Pebble** " ..

*For various purposes, such as grinding the fine  
 stockwork, for opticians and dentists use,  
 for lathes, &c. All sizes from 1 1/2 inch to  
 24 inches diameter. The centre holes of  
 the larger sizes are mounted in lead.*

**Whitening Stones** for cutlery  
**Circular Oilstones**

*With and without centre holes, as above.*  
**Circular Polishing Stones**  
*as above*  
**Polishing Wheels** of every  
 description

**Meinig's Revolving Kitchen  
 Stone with Stand**

*For Hotels, Taverns, and large House-  
 holds, are almost indispensable  
 where a patent knife-cleaner is used, to remove  
 the worn out edges in table and carving  
 knives, — and presents at the same time a  
 generally useful implement for all kinds of  
 grinding, that may occur in a household.  
 The arrangement is so, that it can only be  
 used in the right manner, so that any person  
 can work it with the greatest facility. The  
 stand the most excessive use for at least a  
 fortnight without wear. The Stone  
 is selected of an admirably fine cutting and  
 fine grit for this particular purpose to pre-  
 vent the edges for cutting waste, without wear-  
 ing the stone.*

*See Cords and Bids for the Trade*  
 No 1 2 3

**E.**  
**GRINDING & POLISHING  
 MATERIALS.**

**Emery Cloth** .....  
**" Paper** .....  
**Glass Paper** .....  
**Sand Paper** .....  
**Pumice Stone** .....  
**Artificial Pumice Stone,**  
 quite pure, uniform and sharp  
 cutting.  
**Pumice Stone Powder**  
**Putty Powders** .....  
**Tripoli** .....  
**Rotten Stone** .....  
**Crocus** .....  
**Jeweller's Red** .....  
**Urn Powder** .....  
**Steel Powder** .....

**F.**

**Frames and Mountings.  
 Troughs and Spindles for  
 Grindstones.**

*For Machines Artificially, for  
 Wooden with square spindles  
 and handle ..... cylindrical  
 and a smaller spindle & handle  
 Tripoli wheel .....  
 " on legs .....  
 " with handle .....  
 Iron do. ....*

**Hand Frames for Circular  
 Oilstones.**

*With multiplying wheels, vertical  
 movement .....  
 Do horizontal .....  
 Do with shifting spindles, for  
 Grindstones, oilstones, polishing stones,  
 laps, buff wheels, brush &c. ....*

**Meinig's Universal Grinding  
 Lathes,**

*For fine work and miniature use,  
 is arranged with every requisite for grinding,  
 sharpening, cleansing, polishing, building,  
 drilling, &c. the very best stones and  
 implements extant being mounted on  
 shifting spindles, which can be exchanged  
 in a moment. It is acknowledged to be  
 the most complete and perfect machine of  
 the kind, as no description of abraded  
 work can occur, for which this lathe does  
 not present the most effective and perfect  
 requisite.*

*With alterations*  
 No 1 2 3

**The same, arranged so as to be  
 packed up within the smallest  
 compass, and to be heightened,  
 or lowered at convenience**  
**Loose Spindles for Cir-  
 cular stones,** with nut and  
 washer to fit into chucks or centres,  
 of all dimensions.

**Mounted Hones.**

**No. 00 Small Penknife Hones,**  
*1/2 Green, Labelled.*  
**No 0 Larger ditto** .....  
**No 1 Fine German Lancet  
 Hones,** 1 1/2 inch  
*In cases, Polished Handles.*  
**No 2 Italian Lancet Hone**  
*In Malogany, without Handle.*  
**No 3 Do. Do. larger,** in do  
*In Malogany, with Handle.*  
**No 4 Do. Do.** 6 inch do do  
**No 4 German Hone,** 5 to 5 1/2 in.  
*In Malogany, with Handle*  
**No 5 Italian Water Hone,**  
 7 or 8 inch in do do .....  
**No 5 1/2 Do. Do.** Do. ....  
*In Rosewood.*  
**No 6 Fine German Hone,**  
 7 1/2 inch in Malogany with Handle  
**No 7 Do. Do.** Do. ....  
*In Malogany, without Handle.*  
**No 8 Do. Do.** Do. ....

*In Rosewood, without Handle.*  
**No 9 German Hone,**  
 Stocked without Lid.

**All other descriptions of Mount-  
 ing for Turkey and Oilstones gene-  
 rally, for large hones, &c. &c.**  
**Cheap Mountings and Stones  
 for Exportation.**

**All descriptions of Razor Straps**

**Touch Stones,**

*For testing Gold, Silver, &c., warranted  
 genuine and to stand aque-forts  
 in all sizes*

**Testing Cases,** with stone  
 and bottle.....

**Lots of Turkey and other Stones  
 cut and dressed for the Trade.**

Everybody, conversant with the mechanical arts, knows the practical value of a really good stone,  
 a stone indeed, which can scarcely be overrated, inasmuch as not only a great saving of time and labour, but  
 moreover, the perfectibility of all tools or instruments, and consequently of all workmanship is dependent  
 thereon. C. MEINIG'S Establishments are, to his knowledge, the only in Europe, and probably in the whole  
 world, in which this article is fully represented in all its branches, selected with that knowledge of Stones  
 and their uses, and with that attention to qualities, properties, texture, &c. which is indispensable to ensure  
 the best article for each particular abrading and polishing process.

The stock comprises the best sorts of Stone from all parts of the Globe, which an experience and  
 exclusive attention of sixteen years has brought within the reach of the proprietor, and he, therefore, feels  
 warranted in asserting, that new customers, who may favour his establishment, will find themselves accom-  
 modated in the like satisfactory manner, which has for years gained and preserved the confidence of a con-  
 siderable part of the ablest workmen in England and on the Continent.

**To the Trade and for Shipping** C. M. can hold out all the advantages, which an intimate  
 connection with English and Foreign Quarries, direct importation on a larger scale, and a stock at all  
 times fully assorted with every article and variety in this branch, brings within his power; a long experience  
 enabling him at the same time to point out to shippers, &c. embarking in this line, the descriptions of Stone  
 saleable to the best advantage in various parts of the world.



# CATALOGUE

OF

GOODS MANUFACTURED

BY

MESSRS DAVID METHVEN & SONS,

**AT THEIR WORKS,**

LINKS POTTERY BRICK & TILE WORK,

**KIRKCALDY.**

---

**KIRKCALDY:**

PRINTED BY JAMES BIRRELL.

---

1850.





# CATALOGUE

OF

## GOODS MANUFACTURED

BY

MESSRS DAVID METHVEN & SONS,

**AT THEIR WORKS,**

LINKS POTTERY BRICK & TILE WORK,

**KIRKCALDY.**

---

**KIRKCALDY:**

PRINTED BY JAMES BIRRELL.

---

1850.





the best-selling iron for infants and  
Lancets, and admirably adapted for private  
use with *Shon Cards for the Trade*.

## Circular Wheels

Slips and Pencils.

## Arkansas Oilstone,

|               |   |
|---------------|---|
| French Pebble | „ |
| Glasscutter's | „ |
| Bilston       | „ |
| everywhere    | „ |

For Mechanics Apprentices:

|                                |                      |
|--------------------------------|----------------------|
| <b>Wooden</b>                  | with square spindles |
| and handle                     | .....                |
| "                              | cylindrical          |
| and N. walrus spindle & handle | .....                |

No 7 Do. Do. Do.  
No 8 Do. Do. Do.

# WHITE POTTERY DEPARTMENT.

|                                     |         | Cream<br>Colour. | Spong-<br>ed and<br>Blue<br>Edged. | Paint-<br>ed. | Print-<br>ed. | Best<br>Print-<br>ed. | Flues-<br>cent. | Cane. |
|-------------------------------------|---------|------------------|------------------------------------|---------------|---------------|-----------------------|-----------------|-------|
|                                     | Inches. | S. D.            | S. D.                              | S. D.         | S. D.         | S. D.                 | S. D.           | S. D. |
| Plates, ... ..                      | 10      | 1 3              | 1 6                                | 1 9           | 2 0           | 2 6                   | 3 0             |       |
| Upper ditto, ... ..                 | 9       |                  |                                    |               |               |                       |                 |       |
| Twifler ditto, ... ..               | 8       | 1 0              | 1 2                                | 1 4           | 1 6           | 2 0                   | 2 6             |       |
| Muffin ditto, ... ..                | 7       | 0 10             | 1 0                                | 1 0           | 1 3           | 1 6                   | 2 0             |       |
| Ditto, ... ..                       | 6       | 0 8              | 0 10                               | 0 10          | 1 0           | 1 3                   | 1 6             |       |
| Ditto, ... ..                       | 5       | 0 6              | 0 8                                | 0 8           | 0 10          | 1 0                   | 1 3             |       |
| Ditto, ... ..                       | 4       | 0 5              | 0 6                                | 0 6           | 0 8           |                       |                 |       |
| Ditto, ... ..                       | 3       | 0 4              | 0 5                                | 0 5           | 0 6           |                       |                 |       |
| Flat Dishes, Oval, ...              | 20      | 21 0             | 25 0                               |               | 30 0          | 40 0                  | 60 0            |       |
| Ditto, ... ..                       | 18      | 12 0             | 15 0                               |               | 18 0          | 26 0                  | 45 0            |       |
| Ditto, ... ..                       | 16      | 6 0              | 8 0                                |               | 12 0          | 15 0                  | 30 0            |       |
| Ditto, ... ..                       | 14      | 4 0              | 5 0                                |               | 7 0           | 10 0                  | 20 0            |       |
| Ditto, ... ..                       | 12      | 3 0              | 4 0                                |               | 5 0           | 8 0                   | 12 0            |       |
| Ditto, ... ..                       | 11      | 2 6              | 3 6                                |               | 4 0           | 6 0                   | 9 0             |       |
| Ditto, ... ..                       | 10      | 2 0              | 2 6                                |               | 3 3           | 4 6                   | 7 6             |       |
| Ditto, ... ..                       | 9       | 1 6              | 2 0                                |               | 2 6           | 3 6                   | 6 0             |       |
| Ditto, ... ..                       | 8       | 1 3              | 1 8                                |               | 2 3           | 3 0                   | 5 0             |       |
| Ditto, ... ..                       | 7       | 1 0              | 1 4                                |               | 2 0           | 2 6                   | 4 0             |       |
| Oval Bakers and }<br>Nappies, ... } | 18      | 14 0             | 18 0                               |               | 30 0          |                       |                 | 15 0  |
| Ditto, ... ..                       | 16      | 10 6             | 12 0                               |               | 18 0          |                       |                 | 9 0   |
| Ditto, ... ..                       | 14      | 7 6              | 9 0                                |               | 12 0          |                       |                 | 7 6   |
| Ditto, ... ..                       | 12      | 5 0              | 5 0                                |               | 8 0           |                       |                 | 4 6   |
| Ditto, ... ..                       | 11      | 4 0              | 4 6                                |               | 5 0           |                       |                 | 3 6   |
| Ditto, ... ..                       | 10      | 3 0              | 3 6                                |               | 4 0           |                       |                 | 2 6   |
| Ditto, ... ..                       | 9       | 2 6              | 3 0                                |               | 3 6           |                       |                 | 2 0   |
| Ditto, ... ..                       | 8       | 1 9              | 2 6                                |               | 3 0           |                       |                 | 1 6   |
| Ditto, ... ..                       | 7       | 1 6              | 2 0                                |               | 2 0           |                       |                 | 1 3   |
| Ditto, ... ..                       | 6       | 1 3              | 1 6                                |               | 1 9           |                       |                 | 1 0   |

## FISH DRAINERS, PRICE OF DISHES THEY FIT.

|                                       |         | Cream<br>Colour. | Blue<br>Edged. | Print-<br>ed. | Best<br>Print-<br>ed. | Flues-<br>cent. |  |
|---------------------------------------|---------|------------------|----------------|---------------|-----------------------|-----------------|--|
|                                       | Inches. | S. D.            | S. D.          | S. D.         | S. D.                 | S. D.           |  |
| Cover Dishes, ... ..                  | 10      |                  |                |               | 18 0                  |                 |  |
| Ditto, ... ..                         | 9       | 7 6              | 8 6            | 10 6          | 15 0                  |                 |  |
| Ditto, ... ..                         | 8       | 6 7              | 7 6            | 8 6           |                       |                 |  |
| Ditto, ... ..                         | 7       | 5 0              | 6 0            | 7 0           |                       |                 |  |
| Ditto, ... ..                         | 6       | 4 0              | 5 0            | 6 0           |                       |                 |  |
| Round Cover Dishes, ...               | 10      |                  |                |               | 18 0                  |                 |  |
| Oval Tureens, ... ..                  | 11      | 2 3              | 2 6            | 3 0           | 4 0                   | 5 0             |  |
| Ditto, ... ..                         | 10      | 1 9              | 2 0            | 2 6           | 3 0                   | 4 0             |  |
| Ditto, ... ..                         | 9       |                  | 3 1 6          | 2 0           | 2 6                   | 3 0             |  |
| Ditto, ... ..                         | 8       |                  |                | 1 9           |                       |                 |  |
| Round Tureens, ... ..                 | 11      |                  |                |               | 4 6                   | 6 0             |  |
| Ditto, ... ..                         | 10      |                  |                |               | 3 6                   | 4 6             |  |
| Oval Sauce Tur-<br>eens, complete, }  |         | 10 0             | 12 0           |               | 15 0                  |                 |  |
| Round Sauce Tur-<br>eens, complete, } |         |                  |                |               | 18 0                  |                 |  |







## WHITE POTTERY DEPARTMENT—(continued.)

|                            | Cream<br>Colour. | Paint-<br>ed. | Print-<br>ed. | Flues-<br>cent | Rock-<br>ingham | Black<br>Smear-<br>ed. | Maz-<br>arine<br>Blue. |
|----------------------------|------------------|---------------|---------------|----------------|-----------------|------------------------|------------------------|
|                            | s. D.            | s. D.         | s. D.         | s. D.          | s. D.           | s. D.                  | s. D.                  |
| Unhan. Spong. Teas, 1s. 6d |                  |               |               |                |                 |                        |                        |
| Unhandled Teas, ... ..     |                  | 1 6           |               |                |                 |                        |                        |
| Handled Teas, plain,...    |                  | 2 0           | 2 6           | 3 6            |                 |                        |                        |
| Ditto ditto, pressed,      |                  | 2 0           | 2 9           |                |                 |                        |                        |
| Breakfast Teas, ... ..     |                  | 3 6           | 5 0           | 6 0            |                 |                        |                        |
| Round Teapots, ... ..      |                  | 8 0           | 10 0          | 14 0           | 8 0             | 11 0                   |                        |
| Pressed ditto, ... ..      |                  |               | 14 0          | 18 0           | 10 0            | 16 & 14s               | 16 0                   |
| Round Coffee pots, ...     |                  | 12 0          | 16 0          | 18 0           | 12 0            |                        |                        |
| Toy Teapots, ... ..        |                  | 6 0           | 9 0           |                |                 |                        |                        |
| Do. Sugars, covered,...    |                  | 5 0           | 6 0           |                |                 |                        |                        |
| Do. Creams, ... ..         |                  | 3 6           | 4 6           |                |                 |                        |                        |
| Do. Slops, ... ..          |                  | 3 6           | 4 6           |                |                 |                        |                        |
| Do. Teas, unhandled, ...   |                  | 1 0           |               |                |                 |                        |                        |
| Do. do., handled, ...      |                  | 1 6           | 2 0           |                |                 |                        |                        |
| Creams, plain, ... ..      |                  | 4 6           | 6 0           | 8 0            |                 |                        |                        |
| Do., pressed, ... ..       |                  |               | 8 0           | 10 0           | 4 6             | 9 0                    |                        |
| Covered Sugars, thrown,    |                  |               | 8 0           | 10 0           | 6 0             | 11 0                   |                        |
| Do. do. pressed.           |                  |               | 12 0          | 14 0           |                 |                        | 16 0                   |
| Sugars, on foot, ... ..    |                  |               | 6 0           | 7 0            | 6 0             |                        | 9 0                    |
| Bread Baskets, ... ..      |                  |               | 9 0           | 12 0           |                 |                        |                        |
| Kettles, ... ..            |                  |               | 24 0          | 30 0           | 20 0            |                        | 30 0                   |
| Pressed Jugs, ... ..       |                  | 6 0           | 7 0           | 9 0            |                 |                        | 12 0                   |
| Do. Ewers, Basins & Cha.   |                  | 6 0           | 7 0           | 9 0            |                 |                        |                        |
| Do. Soap & Brush Trays,    | 8 0              | 10 0          | 12 0          | 15 0           |                 |                        |                        |
| Sponge Trays, ... ..       | 8 0              |               | 14 0          | 18 0           |                 |                        |                        |
| Slop Pail and Cover,...    | 3 0              |               | 5 0           |                |                 |                        |                        |
| Foot Pails, ... ..         | 6 0              |               | 9 0           |                |                 |                        |                        |
| Do. do. Feeders, ...       |                  |               |               |                |                 |                        |                        |
| Boots, ... ..              |                  |               |               |                | 4 0             |                        |                        |
| Chests of Drawers, ...     |                  |               |               |                | 1 0             |                        |                        |
| Drab Jugs, ... ..          |                  |               |               |                |                 |                        |                        |
| Torquois do., ... ..       |                  |               |               |                |                 |                        |                        |

12 11 10 9 8 7 inches.  
Stoolpans

1s. 4d. 1s. 2d. 1s. 10d. 8d. 6d.  
10 11 12 13 14 15 16 inches.  
C. C. Plug Basins

1s. 3d. 1s. 6d. 1s. 9d. 2s. 2s. 6d. 3s. 4s.  
10 11 12 13 14 15 16 inches.  
Printed Do.

1s. 9d. 2s. 2s. 9d. 3s. 3s. 6d. 4s. 5s.  
3 4 5 6 7 8 9 10 11 12 in.  
Potting Pots

1s. 6d. 2s. 2s. 6d. 3s. 4s. 5s. 6s. 8s. 10s. 12s.

12½ per cent. Discount, and }  
2½ extra for Cash. }

{ No Allowance for returned Packages  
until received at the Works. }

## BROWN POTTERY DEPARTMENT.

|                                                                |          |
|----------------------------------------------------------------|----------|
| Brown Pans, all sizes, handled,                                | 3 0      |
| Do. Pots, all sizes,                                           | 2 9      |
| Do. Do., all sizes, covered,                                   | 3 9      |
| Do. Chambers, do.,                                             | 2 6      |
| Do. Dishes, do.,                                               | 2 6      |
| Do. Bowles, 12 to 18s.,                                        | 2 6      |
| Do. Water Jugs, 4 to 18,                                       | 2 6      |
| Do. Paint Pots, 4 to 36,                                       | 2 6      |
| Do. Picklers, 24, 18, 12s.,                                    | 2 6      |
| Do. Oyster Jars, 24, 18, 12s.,                                 | 2 6      |
| Do. Honey Cans, 24, 18, 12s.,                                  | 2 6      |
| Do. Salt Cans, 6, 8s.,                                         | 2 6      |
| Do. Bottles of every description,                              | 2 6      |
| Do. Spirit Jars, $\frac{1}{2}$ Galls., 1 Galls., and 2 Galls., |          |
| Do. Money Boxes, 36s.,                                         | 2 6      |
| Do. Salting Jars, Round,                                       | each 2 - |
| Do. do do. Oval,                                               | 2 -      |
| Do. Snuff Jars, all sizes,                                     | 2 -      |
| Do. Trays, 10, 12, 16s.,                                       | 2 -      |
| Two feet Chimney Cans, plain,                                  | each 10  |
| Three feet do. do., do.,                                       | 3 -      |
| Four feet do. do., do.,                                        | 4 -      |
| Two feet Glasgow do., do., with Copes,                         | 10       |
| Three feet do. do., do.,                                       | 3 -      |
| Four feet do. do., do.,                                        | 1 -      |
| Two feet Glasgow Chimney Cans, White with Vandyke Copes,       | 1 - 8    |
| Do. do. do. do. Black Glazed,                                  | 1 - 3    |
| Horned Chimney Cans,                                           | 2 6      |
| Barrel do., do.,                                               | 2 6      |
| Nobed Copes,                                                   | 2 6      |
| Barrel Copes,                                                  | 1 - 3    |
| Horned do.,                                                    | 1 -      |
| Flower Pots, all sizes,                                        | 1 - 6    |
| Do. flats do.,                                                 | 1 - 4    |
| Do. Glazed,                                                    | 2 - 6    |
| Hyacinth Pots,                                                 | 2 -      |
| Shades, all sizes,                                             | 2 -      |
| Seed Pans, round, 4, 6, 8,                                     | 2 -      |
| Do., square, 15, 13, 9, 8, inches,                             |          |
| Beescape Covers, $\frac{1}{2}$ 9-10-8                          | each 3 - |
| Rhubarb Pots,                                                  | 2 -      |
| Crocus do.,                                                    | 2 -      |
| Dallia do.,                                                    | 4 -      |
| Mignonette Pans,                                               | 2 -      |
| Sea-Kail Covers,                                               | 1 - 3    |
| Pheasants, Fountains, Glazed and Unglazed,                     |          |

ORNAMENTAL VASES AND FLOWER POTS, MADE TO  
ANY PATTERN.

NETT PRICES.

Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*,  
**Lancet Hones**, No 1-4 inches  
2-6 " " " " " "  
3-8 " " " " " "  
4-10 " " " " " "  
**Razor Hones** with  
rubber stone,

**Circular Wheels**  
**Slips and Pencils.**  
Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

**Sandstone**  
**Turkey**

**Wooden**  
For Woodwork, Architectural, &c.  
with square spindles  
and handle  
cylindrical  
net & wash or spindle & handle

**Arkansas Oilstone,**  
[For Gravers, &c.]  
Immensely hard, pure and fine cutting  
In **Hones**  
**Pencils**

**Niagara Oilstone.**

**No 7 Do.**  
In Mahogany, without Handle  
**No 8 Do.**  
**No 9 Do.**  
**No 10 Do.**  
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**No 99 Do.**  
**No 100 Do.**



## BRICK AND TILE DEPARTMENT.

|                                      |  |  |  |               |            |
|--------------------------------------|--|--|--|---------------|------------|
| Roofing Tiles,                       |  |  |  | <i>\$1000</i> | <i>50</i>  |
| Ridge do,                            |  |  |  | <i>"</i>      | <i>50</i>  |
| Skylight do,                         |  |  |  | <i>"</i>      | <i>30</i>  |
| Ventilator do,                       |  |  |  | <i>"</i>      | <i>30</i>  |
| Vandyke do. for Border Edging,       |  |  |  | <i>\$1000</i> | <i>50</i>  |
| Drain Tiles, 9 by 9, 15 inches long, |  |  |  | <i>each</i>   | <i>100</i> |
| Do. do. 6 by 6, 15 do.,              |  |  |  | <i>\$1000</i> | <i>100</i> |
| Do. do. 4½ by 4, 15 do.,             |  |  |  | <i>"</i>      | <i>50</i>  |
| Do. do. 3½ by 2, 15 do.,             |  |  |  | <i>"</i>      | <i>30</i>  |
| Do. do. 2½ by 1½, 15 do.,            |  |  |  | <i>"</i>      | <i>25</i>  |

Soles to suit. *half price*

|                                                             |  |  |  |               |           |
|-------------------------------------------------------------|--|--|--|---------------|-----------|
| Drain Pipes, 2½ by 4½, 15 inches long—round and egg shaped, |  |  |  | <i>\$1000</i> | <i>45</i> |
| Do. do., 3 inches, 15 do.,                                  |  |  |  | <i>do.</i>    | <i>30</i> |
| Do. do., 2 do., 15 do.,                                     |  |  |  | <i>do.</i>    | <i>25</i> |
| Do. do., 1½ do., 15 do.,                                    |  |  |  | <i>do.</i>    | <i>15</i> |

Collars to suit.

|                                                                                  |  |  |  |               |           |
|----------------------------------------------------------------------------------|--|--|--|---------------|-----------|
| Drain Pipes with Patent Indented Ends, 2½ by 4½, 15 in. long—round & egg shaped, |  |  |  | <i>\$1000</i> | <i>45</i> |
| Do. do. do. do., 3 inches, 15 do.,                                               |  |  |  | <i>do.</i>    | <i>30</i> |
| Do. do. do. do., 2 do., 15 do.,                                                  |  |  |  | <i>do.</i>    | <i>25</i> |
| Do. do. do. do., 1½ do., 15 do.,                                                 |  |  |  | <i>do.</i>    | <i>15</i> |

Tiles Cut in the same way.

Bricks, Common, Circular and Arch, and other shape or size made to order,  
Paving Tiles, 9 by 9 to 14 by 14 inches,

## WATER AND SEWER PIPES.

|          | 1½, | 2,   | 3,  | 4,   | 5,  | 6,  | 8,  | 9,  | 10, | 12, in di. |
|----------|-----|------|-----|------|-----|-----|-----|-----|-----|------------|
| Glazed   | 9d. | 10d. | 1s. | 1d.  | 3d. | 1s. | 6d. | 1s. | 9d. | 2s.        |
|          | 1½, | 2,   | 3,  | 4,   | 5,  | 6,  | 8,  | 9,  | 10, | 12, in di. |
| Unglazed | 6d. | 7d.  | 8d. | 10d. | 1s. | 1s. | 3d. | 2s. | 2s. | 6d.        |

Knees and Bends to suit the various sizes, double price.

## FIRE CLAY GOODS.

Bricks, common size, Circular and Arch, 12, 13, and 18 inches, and made to any other pattern,  
Pavement, 27 by 18, 24 by 18, 18 by 12, Natched, 18 by 12, plain, 15 by 15, 15 by 10, 13 by 13, 12 by 12, and any other size made to order,  
Covings for Kinaird Grates, all sizes,  
Ovens for domestic use, do.,  
Oven Soles, do.,  
Dampers and Furnace Doors, do.,  
Stove Tubes, do.,  
Vent Linings, 9, 10, 12, and 14 inches diameter,  
Powdered Fire Clay,  
Ornamental Chimney Cans, Moulded, in great variety of patterns,

## WATER AND SEWER PIPES.

|          | 1½, | 2, | 3, | 4, | 5, | 6, | 8, | 9, | 10, | 12 inches diam. |
|----------|-----|----|----|----|----|----|----|----|-----|-----------------|
| Galzed   |     |    |    |    |    |    |    |    |     |                 |
|          | 1½, | 2, | 3, | 4, | 5, | 6, | 8, | 9, | 10, | 12 inches diam. |
| Unglazed |     |    |    |    |    |    |    |    |     |                 |

Border Ballusters, Lintles, Beads, Edgings, or any other pattern made to order.









## Circular Wheels

## Slips and Pencils.

Immensely hard, pure and fine cutting

## In Hones

No 7 Do. Do. Do.  
No 8 Do. Do. Do.

**Voden** with square spinules and handle cylindrical

For More, Call 1-800-368-3333. Ex.

Boston  
Glasscoffer's  
"

French Pebble

## Razor Hones) with

二

**Lancet Hones, No 1—4 inches**

*use, with Show Cards for the Trade.*

Low cost, ranging from 15¢ to 25¢ per unit, and 100% biodegradable. Components meet all targets and admirably adapted for use in all climates.





## A TABULAR SUMMARY

OF

# ALOIS MIESBACH'S COAL MINES AND WORKINGS,

SHOWING

Their Tenure, Annual Yield, Quantity of Coal discovered, and its Value.



| PROVINCES.      |       | NAME OF THE MINE.                                        | TENURE. |                 | ANNUAL YIELD. |           | PERSONS EMPLOYED. |                                 |              | QUANTITY OF COAL DISCOVERED. |                                     |             | VALUE<br>at only<br>2 kreuzers per Cwt. |      |
|-----------------|-------|----------------------------------------------------------|---------|-----------------|---------------|-----------|-------------------|---------------------------------|--------------|------------------------------|-------------------------------------|-------------|-----------------------------------------|------|
|                 |       |                                                          | Fee.    | Lease-<br>hold. | Alum.         | Coal.     | Officials.        | Superin-<br>tendent<br>of Pits. | Work-<br>men | Purchased.                   | First opened<br>by<br>Mr. Miesbach. | Total.      |                                         |      |
|                 |       |                                                          |         |                 |               |           |                   |                                 |              |                              |                                     |             |                                         |      |
| AUSTRIA         | 1     | Gloggnitz . . . . .                                      | 4       | 8               | —             | 200,000   | 2                 | 1                               | 94           | 1,500,000                    | 2,000,000                           | 3,500,000   |                                         |      |
| below the Enns  | 2     | Zillingdorf . . . . .                                    | 6       | 45              | 2000          | 180,000   | 2                 | 1                               | 70           | 2,000,000                    | 8,000,000                           | 10,000,000  |                                         |      |
| ditto           | 3     | Lichtenwörth . . . . .                                   | 6       | 33              | —             | 250,000   | 2                 | 1                               | 100          | —                            | 15,000,000                          | 15,000,000  |                                         |      |
| ditto           | 4     | Grünbach, Maiersdorf. Muthmannsdorf . . . . .            | 25      | 72              | —             | 200,000   | 3                 | 3                               | 183          | 2,000,000                    | 48,000,000                          | 50,000,000  |                                         |      |
| ditto           | 5     | Sollenau . . . . .                                       | —       | 16              | —             | —         | 1                 | 1                               | 20           | —                            | 1,500,000                           | 1,500,000   |                                         |      |
| ditto           | 6     | Grillenbergl . . . . .                                   | —       | 33              | —             | —         | —                 | 1                               | 12           | —                            | 12,000,000                          | 12,000,000  |                                         |      |
| ditto           | 7 8   | Unterwaltersdorf and Trautmannsdorf . . . . .            | —       | 55              | —             | —         | —                 | 1                               | 8            | —                            | 6,000,000                           | 6,000,000   |                                         |      |
| ditto           | 9     | Thallern . . . . .                                       | 52      | 22              | —             | 350,000   | 3                 | 2                               | 290          | 30,000                       | 70,000,000                          | 70,030,000  |                                         |      |
| ditto           | 10 11 | Obritzberg and Wölbling . . . . .                        | 10      | 54              | —             | 30,000    | 1                 | —                               | 20           | 20,000                       | 10,000,000                          | 10,020,000  |                                         |      |
| ditto           | 12 13 | Viedorf and Obenberg . . . . .                           | —       | 30              | —             | —         | —                 | 2                               | 8            | —                            | 1,000,000                           | 1,000,000   |                                         |      |
| ditto           | 14—18 | Gaming, Gresden, Lunz, Hollenstein and Atzberg . . . . . | 24      | 70              | —             | 20,000    | 1                 | 2                               | 25           | 1,000,000                    | 2,000,000                           | 3,000,000   |                                         |      |
| ditto           | 19    | Grossau and Soos . . . . .                               | 49      | 24              | —             | 80,000    | 2                 | 2                               | 94           | 500,000                      | 4,500,000                           | 5,000,000   |                                         |      |
| AUSTRIA         | 20    | Ottanang, Pramet and Frankenburg . . . . .               | 475     | 101             | —             | 60,000    | 2                 | 2                               | 40           | —                            | 200,000,000                         | 200,000,000 |                                         |      |
| above the Enns  | 21    | Wildshut, Radegrund and Ach . . . . .                    | 72      | —               | —             | 100,000   | 2                 | 1                               | 80           | 100,000                      | 5,900,000                           | 6,000,000   |                                         |      |
| STYRIA          | 22    | Leoben . . . . .                                         | 13      | 23              | —             | 250,000   | 3                 | 1                               | 125          | 20,000,000                   | 60,000,000                          | 80,000,000  |                                         |      |
| ditto           | 23    | Ilz . . . . .                                            | 18      | —               | —             | —         | —                 | 1                               | 2            | 8,000,000                    | —                                   | 8,000,000   |                                         |      |
| ditto           | 24    | St. Georgen, Cilli . . . . .                             | —       | 19              | —             | —         | 1                 | 1                               | 20           | 800,000                      | 200,000                             | 1,000,000   |                                         |      |
| MORAVIA         | 25    | Neudorf . . . . .                                        | 13      | 153             | —             | 150,000   | 2                 | 1                               | 80           | —                            | 250,000,000                         | 250,000,000 |                                         |      |
| ditto           | 26    | Luschnitz . . . . .                                      | 22      | —               | —             | 80,000    | —                 | 1                               | 70           | —                            | 150,000,000                         | 150,000,000 |                                         |      |
| HUNGARY         | 27    | Brennberg . . . . .                                      | —       | —               | —             | 250,000   | 4                 | 3                               | 230          | 500,000                      | 4,000,000                           | 4,500,000   |                                         |      |
| ditto           | 28    | Mogyorós near Gran . . . . .                             | —       | —               | —             | 300,000   | 3                 | 3                               | 215          | 50,000                       | 3,000,000                           | 3,050,000   |                                         |      |
| ditto           | 29    | Miklósberg „ „ . . . . .                                 | —       | —               | —             | 200,000   | 2                 | 2                               | 120          | 30,000                       | 10,000,000                          | 10,030,000  |                                         |      |
| ditto           | 30    | Szász near Fünfkirchen . . . . .                         | —       | —               | —             | 50,000    | 2                 | 1                               | 55           | —                            | 1,000,000                           | 1,000,000   |                                         |      |
| Total . . . . . |       |                                                          | 789     | 758             | 2000          | 2,750,000 | 39                | 34                              | 1961         | 36,530,000                   | 864,100,000                         | 900,630,000 | 30,021,000 fl.                          | C.M. |

**Remarks.** It appears, from this Table, that Mr. Alois Miesbach is the owner of 789 Fiefs, and 758 Leaseholds, the greater part of which have been first opened by him, at an expense of at least 700,000 florins C. M. These Fiefs and Leaseholds contain Coal to the extent of about 900,630,000 cwt., of which Mr. Alois Miesbach alone first discovered 864,100,000 cwt. If this entire store of Coal be valued at only 2 kreuzers per cwt., it shows an amount of wealth discovered for the National Industry of 30,021,000 florins C. M., of which the Mines opened by Mr. Alois Miesbach form 28,800,000 florins C. M. From this Table it is also seen, that in the works mentioned, where five Steam Engines are already erected for assisting in the works and for pumping out the water, 2,750,000 cwt. of Coal and 2,000 cwt. of Alum are annually produced, for which, considering the repeated exchange, a capital of 400,000 fl. C. M., and working stock and materials, valued at 166,905 florins C. M., are employed. The sum turned over annually amounts to 1,500,000 florins C. M. In these Mines, 39 Officials, 34 inferior Servants, and 1,961 Workmen are employed, who form, with their families, the number of 3,500 souls; care is taken to lodge these in healthy and roomy dwellings, and for their support, in case of illness or unfitness for service, organised Benefit Societies exist, to which the Owner of the Mines contributes the Medical Assistance and Hospital Money. Most of these works are still in the state of opening and preparation.

VIENNA, December 1850.

but are already in a condition to yield four times the above production, should the demand increase; and, partly through the projected and commenced State Railways, partly through the improvement in Manufactures and the want of Wood, which is becoming more felt every day, they will come into a most flourishing state, and thereby prevent any want of Fuel and any increase in the price of Wood, especially in the capital. The above-mentioned 30 Mining Districts are conducted by the undersigned Director, and with him are two Inspectors of Mines; the Accountant's, Cashier's, and Sale Departments are provided for by a Book-keeper, a Central Cashier, a Comptroller and his Assistant, a Salesman, two Clerks, and several Warehouse-keepers. For the Hungarian works there is Alois Miesbach's General Agency in Pesth, consisting of a General Agent, a Cashier, a Book-keeper, and two Warehouse-keepers. Mr. Miesbach obtained, both at the Industrial Exhibition in Vienna, in the year 1845, and at that in Pesth, in the year 1846, the large Gold Medals, in consideration of the wealth in Coal discovered by him for the National Industry, the immense scale and scientific prosecution of his Mining, and, lastly, as a Testimonial that he was the first in the Austrian Provinces who called into activity, for the benefit of his Country, the working of Coal, with very great expense and most fortunate results.

Heinrich Drasche,  
Director.

Carl Szabo,  
Inspector.

Josef Nuchten,  
Inspector.





## CHARBON DE PARIS,

A NEW FUEL WITHOUT SMOKE OR SMELL,

*Invented and Patented in the United Kingdom of Great Britain and on the Continent,*

BY

MESSRS. POPELIN DUCARRE,

DE BOULEVARD DE L'HOPITAL, 137, PARIS.

---

SILVER MEDAL, 1847—GOLD MEDAL, MAI, 1851.

---

This Charcoal is composed of the waste of all kinds of wood, furze, bavons, tars, sawdust, &c., &c., and is highly recommended on account of its purity; it supersedes charcoal in all its applications, being particularly fitted for every trade and works of art. When made with coal or coke dust, or with peat, it is particularly adapted for domestic purposes and for heating apartments without having the disadvantage, as common coal, of smoking and blackening.

The several apparatus for serving its manufacture are exhibited to a scale of  $\frac{1}{10}$ th of the real size, and have been constructed by order of the French Government, to be deposited in the National Museum of French Industry, Rue St. Martin.

---

*Apply to M. DE FONTAINE MOREAU, Patent Office for Inventions, 24, Boulevard Poissonnière, Paris,  
and 4, South Street, Finsbury, London.*



# Arkansas Oilstone,

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones**  
**Pencils**

**Niagara Oilstone,**

(For Gravers,)

Hard, coarser cut than Arkansas.

In **Hones** Do. Do. Do.

# Circular Wheels

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gouges, Parting Tools, &c.

**Sandstone**

**Turkey**

**Persian**

**Arkansa**

but a small spindle is handle

cyindrical

For use in grinding tools for Lances and

Lances, and admirably adapted for private  
use, with *Stone Cards for the Trade.*

**Lancet Hones, No 1-4 inches**

"

2-6 "

**Razor Hones**

"

3-8 "

with  
rub-  
stone,

4-10 "

**Cutler's Sandstone**

**French Pebble**

*Morrises Stirling's*  
*Patent*  
*Union Bell Metal.*

---

*Price* in small Castings about one half that of common Bell Metal, and in large Bells little more than one third.

*Tone* superior to that of Bell Metal

*Strength* to resist a blow, nearly the same as that of common Bell Metal, and quite equal to that of best Bell Metal.

For information apply at  
*Mr. Barretts.*

*Bishopsgate Foundry*  
*Skinner Street*

by numerous experiments.....

J. D. MORRIS STIRLING, Esq.

\* The average strength of iron is

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# Arkansas Oilstone.

(For Gravers, &c.)  
 Immensely hard, pure and fine cutting.  
**In Hones**  
**Pencils**

**Niagara Oilstone,**  
 (For Gravers.)  
 Hard, coarser cut than Arkansas.  
**In Hones**

**Spanish Stone**

# Circular Wheels

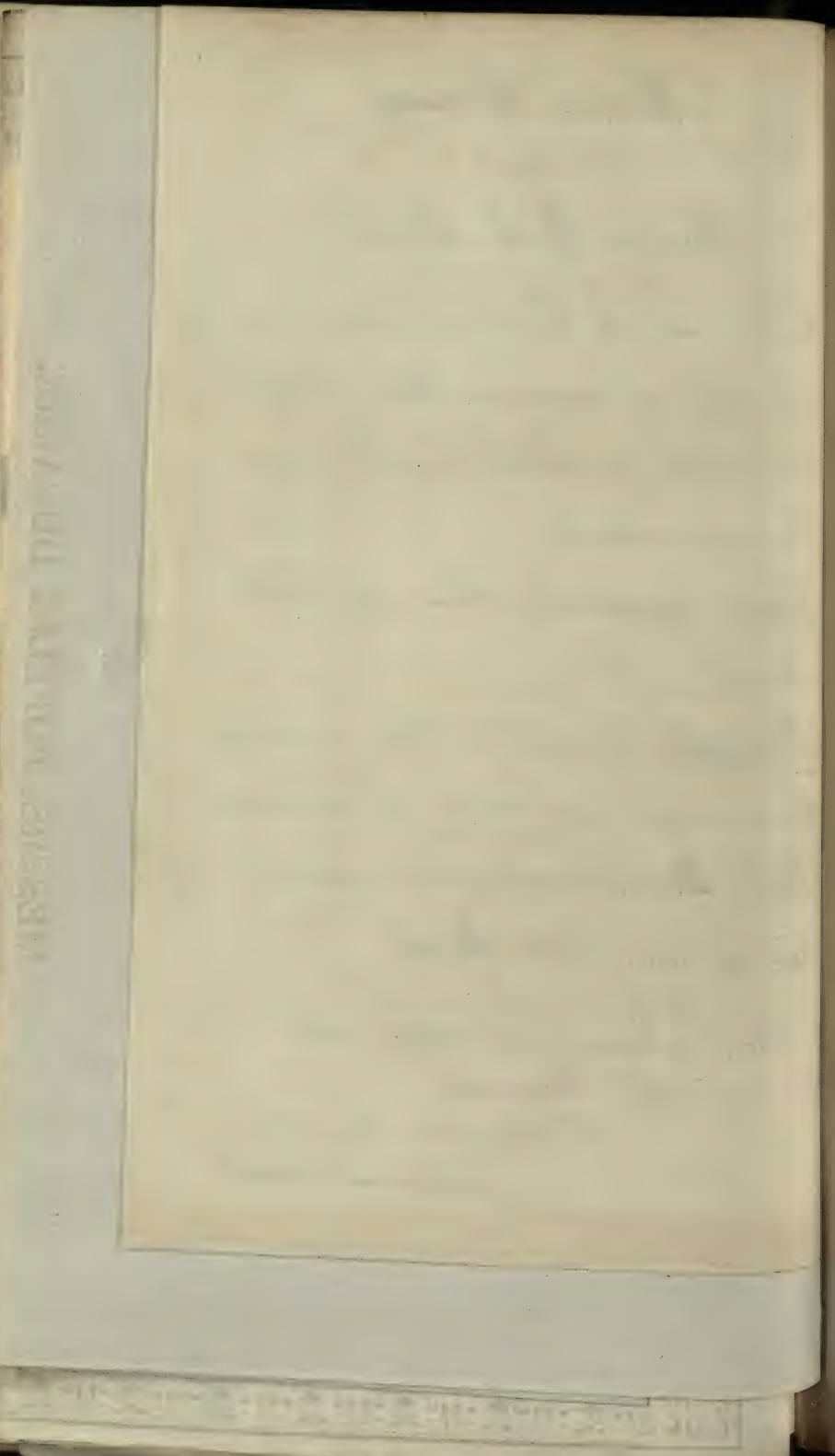
**Slips and Pencils.**  
 Square, Oblique, Pointed, Rounded, for  
 Gouges, Paring Tools, &c.  
**Sandstone**  
**Turkey**  
**Persian**  
**Arkansas**  
**Charnley Forest**  
**Welch**

Lancets, and admirably adapted for private  
 use, with Sharp Cards for the Trade.

**Lancet Hones,** No 1-4 inches  
 " " " " " "  
**Razor Hones** } with  
 " " " " " " } tubes,  
 " " " " " " } 4-10 "

**Cutler's Sandstone Blocks.**  
 12 inches 15 inches 18 inches

**French Pebble**





ABRIDGED REPORT BY THE LATE J. OWEN, Esq.

Supervisor of Metals to the Admiralty, and of Her Majesty's Dockyard, Woolwich.

(PUBLISHED BY PERMISSION OF THE LORDS OF THE ADMIRALTY.)

ON

MORRIES STIRLING'S PATENT GUN METAL.

EXPERIMENT I.

The Metal was cast into ingots and rolled into boltstaves. The tensile strength of which was ascertained in the testing machine, and compared with that of boltstaves of other metals with the following results, which show the average breaking strain, in tons, per square inch.

|                       | Breaking strain | Greatest stretch in a given length. |
|-----------------------|-----------------|-------------------------------------|
| Stirling's Metal..... | 27.             | Tons..... 1. 1 Inch                 |
| Muntz's do. ....      | 25.             | „ ..... 2. 5 „                      |
| Iron .....            | 22. 4           | „ ..... 3. 5 „                      |
| Copper.....           | 21. 15          | „ ..... ..                          |

It is considered that, in addition to its superior strength, Morries Stirling's Metal is more favorable for fastenings, in consequence of its greater resistance to stretching.

EXPERIMENT II.

Gun Metal cast at Woolwich, of the ordinary good mixtures, as given below, was tested, together with Morries Stirling's, in the testing machine, to ascertain the comparative tensile strength.

| GUN METAL. |          |       |
|------------|----------|-------|
| Copper.    | Tin.     | Zinc. |
| 20 .....   | 2 .....  | 1     |
| 6 .....    | 1 .....  | 0     |
| 7 .....    | 1 .....  | 0     |
| 8 .....    | 1 .....  | 0     |
| 9 .....    | 1 .....  | 0     |
| 10 .....   | 1 .....  | 0     |
| 88 .....   | 12 ..... | 0     |
| 92 .....   | 8 .....  | 0     |

|                                                                                                                         |              |
|-------------------------------------------------------------------------------------------------------------------------|--------------|
| Mean tensile strength, per square inch, of the above mixtures .....                                                     | 11. 66 tons  |
| Mean tensile strength, per square inch, of Morries Stirling's Patent Metal, as ascertained by numerous experiments..... | 16. 42 tons. |

\* The average strength of iron is higher, but the actual strength of the sample tried is given.

### EXPERIMENT III.

Morries Stirling's Mixed Metal being cheaper than copper and the mixed metals generally used in ship building for Bolt-staves, Bolt-nails, Deck-nails, &c., it was considered desirable to compare it with the ordinary metal for these purposes, in the following particulars:—

1. Strength.
2. Stiffness in driving.
3. Capability of being re-manufactured as old metal.

In all these particulars it was found equal, *in all respects*, to the metal hitherto used.

### EXPERIMENT IV.

The same mixture was tried in sheathing nails. It was found to be slightly *electropositive*, and therefore protective to all kinds of copper sheathing. It also cast a good point, and drove well, since it is cheaper than the ordinary metal it seems desirable to use it for sheathing nails.

### EXPERIMENT V.

Its stiffness as compared with ordinary good gun metal was thus ascertained:—Bars were cast 1 inch square and 3 feet long, they were placed on supports 2 feet 3 inches apart, and weights were gradually hung on the middle, by which means a permanent set was given to the bars.

The following deflections taken from the centre show the superior stiffness of this Patent Metal.

|                                                    |         |
|----------------------------------------------------|---------|
| Gun Metal (copper 10, tin 1) Mean deflection)..... | 73. 44. |
| Morries Stirling's Metal <i>only</i> .....         | 16. 77. |

(Signed)

J. OWEN.

17th July, 1850.

The results of the above experiments were submitted to and approved of by the Lords of the Admiralty, and the following Report by the Storekeeper General may be added.

SIR,

Admiralty, 3rd June, 1848.

I have to acquaint you with reference to your note of the 29th April last, and in pursuance of their Lordships' directions, that the reports received from the Dockyard Officers at Portsmouth and Chatham on your Patent Metal are satisfactory.

Your humble Servant,

R. DUNDAS.

Storekeeper General.

J. D. MORRIES STIRLING, Esq.

38, Colmore Row, Birmingham, August 2nd, 1849.

"With reference to your new Metal that I have been trying this morning, my opinion is, that it rolls better, is in the grain, and is superior to any other metal used for sheathing."

I am, Sir,

Your obedient Servant,

MORRIES STIRLING, Esq.

(Signed) SAMUEL WALKER, JUN.

82, Blackfriars Road, London, June 27th, 1848.

SIR,

My experiments on your metal in comparison with the best quality of gun metal, lead me to the conclusion that metal is much more rapidly acted on both by muriatic acid and common salt than yours is in the same space of time; there is no comparison in the amount of oxidation which the copper in the gun metal undergoes in the same circumstance of exposure to the same acting substances as in yours.

I am, Dear Sir,

Yours most truly,

MORRIES STIRLING, Esq.

(Signed) JOHN THOMAS COOPER.

London Works, Birmingham, 31st July, 1849.

SIR,

We have for upwards of six months been employing your Patent Alloys for Gun Metal Castings, and are as to their superior quality for Mill Bearings generally, as well as for Railway Engines and Carriages.

We are, &c.

MORRIES STIRLING, Esq.

FOX, HENDERSON, & Co.

Dundyan Iron Works, 18th November, 1850.

Mr. MORRIES STIRLING's Patent Gun Metal has been used here for the last twelve months, for bearings in the Mills, and to test its lasting qualities, bearings made from it have been placed alongside of gun metal bearings simulated, and subjected to exactly the same work, and the result is, that the Patent Metal has lasted one-half time than the other.

MORRIES STIRLING, Esq.

(Signed) JOHN MACKENZIE.

*The Rolling Mills alluded to are rail-mills.*

Eastern Counties Railway, London, 8th August, 1850.

SIR,

In reply to yours, I beg to state, that on the 24th of April last, I refitted No. 1 Mail (six-wheel carriage) with Brasses, four of which were our own make, the other two were of Mr. STIRLING's Metal, and up to the 2nd July, the carriage had run over was 7,592 miles. The Brasses were taken out and examined; I found that the two (STIRLING's) were much less worn than the other four, and I have no hesitation in stating, from the above experiment, are far superior to any we have had running in the Carriage Department.

Yours, &c.

BARRETT, Esq.

(Signed) JOHN HUNTER.

*Locomotive and Carriage Superintendent.*





## TOUGHENED CAST IRON.

A mixture of Cast and Wrought Iron in certain proportions. Castings made of this Iron are nearly 100 per cent. stronger, both transversely and tensily, than those made from any other Iron; and, as they can be made of less dimensions and consequently much lighter, the use of the Toughened Cast Iron is found to be both advantageous and economical.

The following are some of the experiments made for the Commissioners appointed to enquire into the application of Iron to Railway purposes, by Mr. EARON HODGKINSON:—

Bars 10ft. long, 2in. square, and, with the supports, 9ft. apart, broke as follows:—

|                                 |           |
|---------------------------------|-----------|
| Blaenavon Iron, No. 2 . . . . . | 1220 lbs. |
| Low Moor Iron, No. 1 . . . . .  | 1207 "    |

Bars cast at Warrington, composed as follows:—

|                       |   |        |
|-----------------------|---|--------|
| Madeley Wood, 8 parts | } |        |
| Lilleshall 6 "        |   |        |
| Pontypool 3½ "        |   | 1375 " |
| Charcoal Iron 5 "     |   |        |

Stirling's Second Quality—

|                                                                         |        |
|-------------------------------------------------------------------------|--------|
| Calder Hot Blast, No. 1, with 20 per cent. of Malleable Scrap . . . . . | 2174 " |
|-------------------------------------------------------------------------|--------|

This Iron is termed *second quality* because a still stronger mixture, more especially for large castings, is produced by employing a No. 3 Iron with the requisite proportion of Malleable Scrap. In a series of experiments made at the Dundyvan Works, and described at page 416 of the Commissioners' Report, the strength of bars of this mixture, of the same size as the foregoing, is shewn to be much greater, the breaking weight being **2601 lbs.** It will be observed how nearly the Dundyvan Experiments correspond with Mr HODGKINSON'S as the two series of experiments on No. 1 Patent Toughened will show:—

|                                 |           |
|---------------------------------|-----------|
| Hodgkinson . . . . .            | 2174 lbs. |
| At the Dundyvan Works . . . . . | 2152 "    |
| Ditto . . . . .                 | 2234 "    |

At page 9, the result of some experiments on the tensile strength of the same Iron (No. 1) by Mr. HODGKINSON, will be found to give above **12 tons** per square inch; the average of 17 other descriptions of Iron experimented upon, gave between **6 and 7 tons**, showing thus an increase of nearly 100 per cent. in favour of the Toughened Iron. The kind of Iron called Stirling's third quality, contained cinder, and although stronger than any other I tried by Mr. HODGKINSON, is not recommended by Mr. STIRLING, and is not now made. At page 101 an abstract is given, showing the comparative strength per square inch, from which it will be seen that Mr. STIRLING'S Iron is nearly 50 per cent. superior to 16 other sorts of Iron experimented upon.

Other experiments were made by Mr. OWEN for the Admiralty, and by Messrs. Rennie and others, all with the same results, showing the great increase of strength obtained in the Patent Iron.

The economy of its use is apparent, for instance—Scotch Pig Toughened can be had now for about 2l. 10s. per ton, and this is at least 50 per cent. stronger than the best Blaenavon, which costs about 3l. 3s.

The opinions expressed by Messrs. FAIRBAIRN, PAGE, FOX, MAY, SCOTT RUSSELL, MARE, and others who have made themselves acquainted with the subject, are of a highly favourable character.

The Iron Bridges over the Thames at Windsor, and the Iron portions over the Bridge at Battersea, constructing under the superintendence of Mr. PAGE, also the Cast Iron portions of the Bridge at Yarmouth, by Mr. WALKER, are being made of Mr. STIRLING'S Patent Iron.

The following Iron Manufacturers are duly licensed to make the Iron:—

|                                                                                             |                               |
|---------------------------------------------------------------------------------------------|-------------------------------|
| Mr. JOHN WILSON . . . . .                                                                   | Dundyvan Iron Works, Glasgow. |
| Messrs. BAIRD . . . . .                                                                     | Gartsherrie, ditto.           |
| Messrs. LLOYDS, FORSTER, & Co. . . . .                                                      | Wednesbury.                   |
| Messrs. T. & J. BAGNALLS . . . . .                                                          | Westbromwich.                 |
| The HORSLEY COMPANY . . . . .                                                               | Tipton.                       |
| The FORTH IRON COMPANY . . . . .                                                            | Glasgow.                      |
| The CLYDE IRON COMPANY . . . . .                                                            | Ditto.                        |
| Messrs. RALSTON, GOODWIN, & Co., Turner's Court, Glasgow, will also supply the Patent Iron. |                               |

There are three different qualities of the Toughened Cast Iron now made viz.:—No. 1 for small castings; No. 2 for large castings; such as girders, beams, &c.; and No. 3 extra, for heavy machinery, rolls, &c.

The Price of Toughened Cast Iron is from 10s. to 12s. per ton more than Pig Iron unmixed.

Further particulars may be obtained on application to Mr. JEE, Civil Engineer, 6, John Street, Adelphi, London; or to **A. MACNAUGHT, 2, Queen Street Place, Upper Thames Street, and Paul's Wharf, 25, Upper Thames Street.**

Gravestone, (For Graves, &c.)

Immensely hard, pure and fine cutting

In **Hones**  
**Pencils**

**Niagara Oilstone,**  
(For Graves, &c.)

Hard, coarser cut than Arkansas,  
In **Hones**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

**Sandstone**

**Turkey**

**Persian**

**Arkansa**

**Charnley Forest**

Lancets, and admirably adapted for private  
use, with Silver Cases, for the Trade.

**Lancet Hones,** No 1-4 inches

**Razor Hones** } with  
                      } with  
                      } case.

**Cutler's Sandstone Blocks**

No 8 Do. Do. Do.

Pebble



## MALLEABLE IRON.

The improvements in the manufacture of Malleable Iron, are, **FIRST**—the addition of certain metals or metallic compounds to iron in the puddling furnace, by which the resulting Malleable Iron is rendered much more fibrous and stronger than ordinary Malleable Iron, so much so, that common or Merchant Bar becomes equal to best Bar, thus saving one process to the manufacturer: also very ordinary iron which can scarcely be used at all, is made equal to the best. The following abstracts of experiments are given in the Report of the Commissioners appointed to enquire into the application of Iron to Railway purposes, page 417.

|                                                                                          | Breaking Strain in Tons<br>per square inch. |
|------------------------------------------------------------------------------------------|---------------------------------------------|
| Average of Mr. Jesse Hartley's Experiments at Liverpool, on many sorts of Malleable Iron | 23·23                                       |
| Average of S. C. Crown Iron from numerous trials at Woolwich Dockyard . . . . .          | 24·47                                       |
| Average of best Dundivan Bar . . . . .                                                   | 24·33                                       |
| Average of Mr. Stirling's best quality . . . . .                                         | 27·81                                       |
| Ditto ditto another quality . . . . .                                                    | 27·70                                       |

The actual cost of the process being only a few pence per ton, the patent is well worth the attention of all manufacturers of Wrought Iron.

**When Mr. Stirling's Toughened Pig is re-melted and used in the puddling furnace instead of common Pig, a superior Iron is produced; which will be found advantageous in the manufacture of thin plates and sheets.**

**SECONDLY.**—By the use of a different metal or metallic compound in the puddling furnace, a quality of iron is produced quite opposite in its character to the last, as instead of being fibrous it becomes hard and crystalline, approaching the nature of steel. The average stretch of common round bars one inch diameter is about 3 inches in two feet, whereas the average of Mr. Stirling's hardened Iron is from  $\frac{1}{4}$  to  $\frac{1}{2}$  of an inch in the same length. This shows the great stiffness obtained by his method. The crystalline nature of this description of Iron causes it to resist compression, lamination, and abrasion. It will be found particularly adapted for the top portions of wrought iron girders.

For Rails and Wheel Tyres it is specially adapted. When the top of the rails and the outside of the Tyres are made of this Iron, the wear and tear and lamination so universally complained of, are avoided, and Rails and Tyres so made are found to answer remarkably well. They have been used on the East Lancashire, Caledonian, Edinburgh and Glasgow, and other Railways with great success, and the extra cost of such Rails being only from 7s. 6d. to 10s. per ton, it is certainly well worth the consideration of all Railway Companies and Engineers, as if adopted by them, the cost of repairs and maintenance will be materially lessened.

Further particulars as to mode of manufacture and terms of license, may be obtained on application to Mr. JEE, Civil Engineer, 6, John Street, Adelphi; and **A. Macnaught, 2, Queen Street Place, Upper Thames Street, and Paul's Wharf, 25, Upper Thames Street.**





Thomas Stirling, Son  
General Slate Works, Colchester Road, Lambeth.  
between Hungerford Suspension Bridge & Waterloo Bridge.  
Importers, Manufacturers, and Inventors.

Thomas Stirling begs to call attention to his Slate Cabinet shewing that Slate is applicable to the formation of Strong Rooms, Powder Magazines, Larders, Penion Houses, Partitions to rooms, and any additions such as Water Closets carried outside of Houses and every position where combustible material is forbidden by the Building Act to be used, as also the covering of the cabinet, it being formed by the Bottom of a Slate Cistern consisting of 5 Slabs of Slate secured together in Panels by a method invented by the Exhibitor, and which renders it stronger than if it were all in one piece (which could not be obtained generally from any Quarry). This will show that Slate Cisterns of any size can be made for the purpose of containing water or any other liquid as the same method can be applied to the sides and ends, the depth could be increased to as much as required. The same method is also applicable to the covering of the roofs of Mansions forming a sound, lasting and serviceable flat roof far before lead or any other covering, and not more expensive than a sufficiently strong lead roof, as nothing more is required than Iron Girders 5 or 6 feet apart the Slabs being so constructed to complete the remainder. Slate is also extensively used in fitting up the floors and compartments of the Public Baths and Washhouses, which can be seen at those recently erected in Westminster, the Slate Work of which was executed by the Exhibitor, as also at all the Public Baths & Washhouses recently erected. He is also about to commence the Slate Work at the St James Baths & Washhouses in Broad St. Golden Square, it is also a clean and wholesome material to use for fitting up Stables, and is applicable to the Mangers, Stall Divisions, Linings, Floors & Drains, & the Floor may be made so that it will always be properly drained & dry. The New Stables erected for Her Majesty at Windsor Castle in 1841, were partially fitted up with Slate by the Exhibitor, it is also admirably adapted for Balconies, Larders, Wine Cellars, Pairs, Linings for Damp Walls, Wine Coolers, Bread, Pockling & Pig Troughs, Head & Foot Stones, Tombs & Monuments, Dock & Gun Drills, coverings to roofs, of all descriptions, Sinks cut out of the solid Slate, Floors of Conservatories & Harehouses, Urinals, Paving for Railway Stations being considerably stronger than stone & not liable to vegetate as stone (also to Basement Floors, being an excellent preventive to damp & many other purposes too numerous to mention in this confined space.



The following is a list of the articles exhibited, & in general use.

- 1 Cabinet Filler in hand, self acting
- 2 A Filler that can be supplied by hand or made self acting
- 3 A small State Cabinet
- 4 A Dressing Trough
- 5 Common saddle back State Bridge
- 7 A sunk Channel in State
- 8 A solid State sink
- 9 A State sink in 3 pieces
- 10 A Washing Basin for Water Closet &c
- 11 An Ornamental Door Table Top
- 12 A Sofa Table Top
- 13 A side Table Top
- 14 A Bed for ladies with Table Top
- 15 Do Do
- 16 Ink Stands
- 17 A Water closet supply Box for Cabinet
- 18 A wash for State Cabinet
- 19 An iron set for do
- 20 A drawing off Tap for do
- 21 Samples of various nails used in State Work
- 22 Samples of screws do do
- 23 Staff of Roof covered with Slate, that shales similar to the White side of Cambrelwell Church, the stiles of Westminster Church, and Hampshire; the whole of the roof of a Church at Chandy Park near Stonehamset with by John Smith, Esq and part of the roof of a Church at Henley, in Hampshire, built by the Right Hon. the Earl of Sandwich, and the whole of the roof of a Mansion at Beacon, South Wales, belonging to Lloyd G. Watkin, Esq. This method was first invented by the Exhibitor, being more durable than lead, and much cheaper, and is 75 per cent less in maintenance than any other article.
- 24 Bangor Slab slating same as the South side of Cambrelwell Church
- 25 Half of Roof covered with Imperial Slates from the Bangor Quarry
- 26 Half of do with Rag Slates from Old Delabate Quarry
- 27 Half of do with Green Slates from Stanzas Quarry



32. Staff of dog with green flag. Slates from Planters Quarry  
29. D<sup>o</sup> with Red Duchesne slates with 3 green slate diamonds from d<sup>o</sup>  
30. D<sup>o</sup> with Patent cut Fancy Slates from Festenoy Quarries  
31. D<sup>o</sup> with open space new Quarry Duchesne Slates from Planters Quarry  
32. D<sup>o</sup> with Imperial Slates from Atherdown Quarry near Machynlleth  
33. A slate Bed Room Chimney Piece from Old Delabole Quarries.

34. A Dining Room d<sup>o</sup>

35. A carved head Stone

36. A cut Clock Face.

The sample Slates marked Bangor are from the well known Penrhyn Quarries belonging to the Hon<sup>ble</sup> E. G. Douglas Pennant.

The sample Slates marked Planters are from the well known Quarries belonging to J. A. Smith, Esq<sup>r</sup>

The Sample Slates marked Festenoy, Mathew Son & Holland are from the slate Quarries at Festenoy

The sample Slates marked Dorothea Company are from their Quarries near Carnarvon, & Shipped by Mr. Tho<sup>s</sup> Turner of Carnarvon.

The sample Slates marked Gaswyn Quarry near Machynlleth are from the Quarries of Messrs J. W. Howlands & Co.

The sample Slates marked Atherdown, are from the Quarries of Mr. R. D. Jones near Machynlleth.

The sample Slates marked old Delabole are from the Old Delabole Slate Company's Quarries near Camelford, Cornwall.

The sample Slates from the Westmoreland Quarries are from the following producers

The Earl of Burlington

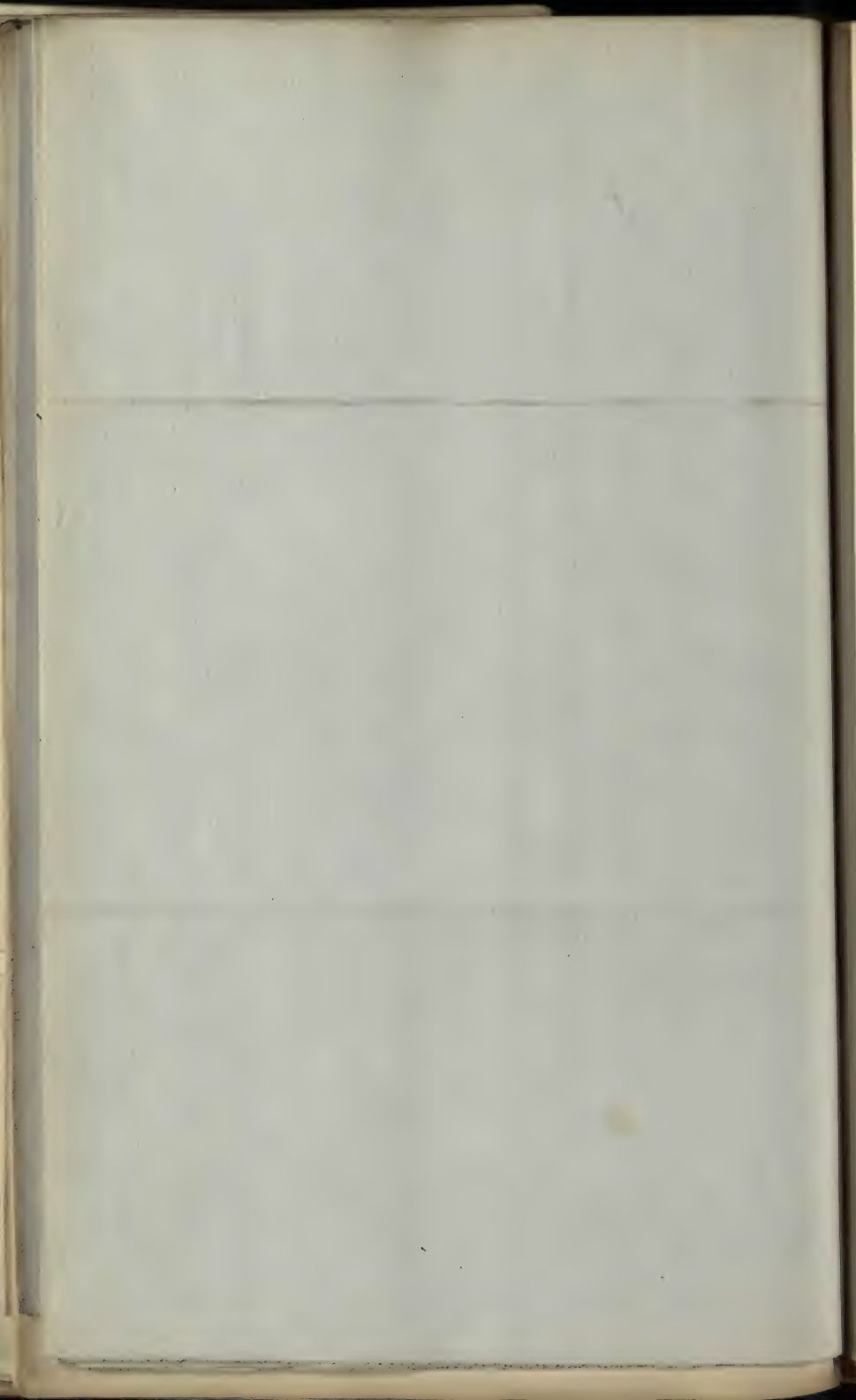
John P. Marshall Esq.

R. Mandale Esq.

L. Bird, Esq.

J. Parker, Esq.

The Fancy and other Slates from Messrs Mathew & Sons Quarries are cut by N. Mathew, Esq's Patent Machines, Models of which are Exhibited.





## MINERALOGY.

As it is impossible to acquire a practical knowledge of MINERALOGY without the aid of specimens to facilitate the study, J. Tennant, Mineralogist to Her Majesty, arranges a series consisting of Metals, Earths, and Rocks, in a CABINET, with Catalogue, from Two to One Hundred Guineas each, in the following proportion :—

|                                                                                                   |         |
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J. T., having recently purchased at the Stowe sale the Buckingham collection, in addition to several other large collections, and having extensive connexions in the mining districts of England and in foreign countries, can, at a short notice, make up collections to any extent ; and is enabled to supply almost every variety of mineral.

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Twenty different Minerals named, with Carbonate of Soda, Borax, and Microcosmic Salt. Price 3s.

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CHEMICAL APPARATUS, for the Examination of Minerals, containing improved Brass Blowpipe, Agate Mortar, Electrometer, Magnetic Needle, Platina Spoon-Forceps, Wire and Foil, Spirit Lamp, Wax Candle, Charcoal, Magnet, Brass Forceps, Evaporating Capsule Glasses and Frame ; Knife, Forceps, and File ; Metallic Rods for precipitating Metals ; Glass Tubes, Litmus Paper, Magnifying Glass, Hammer, Crucible, Touchstone, and Minerals for Experiments ; also, TESTS, ACIDS, FLUXES, &c., fitted in cases, price £5. 5s.

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## FOR SCIENTIFIC & PROVINCIAL MUSEUMS.

FOURTEEN MODELS, carefully coloured from the originals, of Teeth and Bones of the *Iguanodon*, *Hylasaurus*, and *Gavial*, discovered by Dr. Mantell, in the strata of Tilgate Forest, and now preserved in the British Museum (*Natural History, North Gallery, Room III., Case—Reptiles*). Price of the whole suite, 1l. 2s. 6d.

The above are described in *Wonders of Geology*, by Dr. Mantell.

Cast of head of *Crocodylus Spenceri*, from Isle of Sheppey ; figured in Bridge-water Treatise by Dr. Buckland, Plate 25'. Price 5s.

A fine cast in Plaster, carefully coloured, of that interesting Fossil Saurian the

### PLESIOSAURUS DOLICHODEIRUS.

The original specimen of the unique Skeleton of this species of *Plesiosaurus*, now in the British Museum, was obtained from the Lias, near Glastonbury, and is described and figured in the Bridgewater Treatise by Dr. Buckland (vol. ii. pl. 17).

The Cast, mounted on a strong Wood Frame, measuring 6 ft. 3 in. in length, by 3 ft. 4 in. in width, is well adapted for Scientific and Provincial Museums, as exhibiting the remarkable characters and peculiarity of structure of this singular Reptile.

(Price of the Cast, £4.)

Mr. TENNANT gives Private Instruction in MINERALOGY, with a view to facilitate the study of GEOLOGY, and of the application of Mineral substances in the Arts, illustrated by an extensive Collection of Specimens, Models, &c.

149, STRAND, April, 1850.

statue de S. M. la Reine d'Angleterre.

PARIS, 1851.

## GEOLOGY.

PERSONS wishing to become acquainted with this interesting branch of Science will find their studies greatly facilitated by means of elementary collections, which can be had at Two, Five, Ten, Twenty, or Fifty Guineas each.

Arranged by J. TENNANT, Geologist, 149, Strand, London.

A collection for Five Guineas, which will illustrate the recent works on Geology, contains 200 specimens, in a Mahogany Cabinet, with five trays: viz.—

MINERALS which are either the components of Rocks, or occasionally embedded in them:—Quartz, Agate, Chalcedony, Jasper, Garnet, Zeolite, Hornblende, Augite, Asbestos, Felspar, Mica, Talc, Tourmaline, Calcareous Spar, Fluor, Selenite, Baryta, Strontia, Salt, Sulphur, Plumbago, Bitumen, &c.

NATIVE METALS, or METALLIFEROUS MINERALS; these are found in masses or beds, in veins, and occasionally in the beds of rivers. Specimens of the following Metallic Ores are put in the Cabinet:—Iron, Manganese, Lead, Tin, Zinc, Copper, Antimony, Silver, Gold, Platina, &c.

ROCKS; Granite, Gneiss, Mica-slate, Clay-slate, Porphyry, Serpentine, Sandstones, Limestones, Basalt, Lavas, &c.

SILURIAN FOSSILS, from the Llandeilo, Wenlock, and Ludlow Rocks.

SECONDARY FOSSILS, from the Devonian, Carboniferous, Lias, Oolite, Wealden, and Cretaceous Groups.

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These models are constructed of various kinds of Wood, fitted together from actual Measurements of the Strata in the Coal and Lead Mining Districts of the North of England. The upper part of each Model represents the surface of the ground; the sides exhibit four vertical sections, each of which corresponds with the sections usually drawn in Geological Works, and the base of each Model represents a horizontal plane at a certain depth under the surface, according to scale.

To students in Geology, and others interested in Mineral Districts, these Models afford a clearer idea of Geological Phenomena than ordinary plans and sections, presenting a fac-simile of the objects represented, which can be studied in every variety of position, and thus exhibit and explain the subterranean, as well as surface relations of the various Strata, Beds of Coal, and Mineral veins.

The models illustrate the Nature of Stratification; of Valleys of Denudation; Succession of Coal Seams in the Newcastle Coal Field; Strata of Adjacent Lead Mine Districts; the effects produced by Faults or Dislocations; Intersections of Mineral Veins, &c.; and are accompanied with a letter-press description.

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Sold in Cases, bound and lettered to resemble large octavo, quarto, or folio volumes.

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|--------------------|------------------|------|
| Set of Six Models, | 3 inches square, | £2 2 |
| Same,              | 4 inches square, | 2 10 |
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It may be proper to observe, that the train of investigation which is required to study these Models is wholly apart from the theoretical researches which extend to the original formation of the rocks, and is confined to such facts as are open to every-day observation, and of which no doubt can possibly exist.

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JAMES TENNANT, Mineralogist to Her Majesty, 149, STRAND, London.



# EXPOSITION UNIVERSELLE DE LONDRES.

SOCIÉTÉ ANONYME

DES

MINES ET FONDERIES DE ZINC

DE LA

**VIEILLE-MONTAGNE.**

ADMINISTRATION

France, à Paris. — Belgique, à Liège.

ADMINISTRATION

En Angleterre. — En Amérique.



Statue de S. M. la Reine d'Angleterre.

PARIS, 1851.



CONSEIL D'ADMINISTRATION DE LA SOCIÉTÉ.

MM. LE COMTE LE HON, *président*;  
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Cette opération ter

## NOTICE

SUR LA

# SOCIÉTÉ DE LA VIEILLE-MONTAGNE

## ET SUR L'INDUSTRIE DU ZINC.

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Les premières extractions des minerais calaminaires de la Vieille-Montagne sont signalées dans les annales du duché de Limbourg, dès le xv<sup>e</sup> siècle (1425).

C'est la connaissance ancienne de cette mine qui lui a fait donner le nom d'Altemberg (Vieille-Montagne), titre sous lequel on la trouve désignée plus tard dans les comptes de redevances des octrois des mines dans ce duché.

Pendant près de quatre siècles, les minerais qui en provenaient n'ont été employés qu'à la fabrication du laiton (cuivre jaune).

La réduction du minerai de zinc à l'état métallique fut le but principal de la concession faite en 1806, par décret impérial, des mines de la Vieille-Montagne et des gisements calaminaires qui l'environnaient.

La première apparition du zinc date de 1808; ce métal fut d'un usage très-restreint jusqu'en 1815, époque où M. Mosselman, devenu propriétaire de la concession, appliqua la puissance de ses capitaux et les progrès de la science à perfectionner l'exploitation de ses mines, la fusion du minerai calaminaire et le laminage du zinc; il fit pénétrer le nouveau métal dans la consommation, lui ouvrit des débouchés au dehors et fut le véritable créateur de cette industrie, qui, par l'importance de ses produits et l'étendue de ses applications, assure, en Belgique et en Prusse, un travail constant à plus de dix mille ouvriers et alimente beaucoup d'autres industries.

C'est par ce motif que le zinc belge est encore connu en Angleterre et en Amérique sous le nom de *Mosselman-zinc*.

En 1837, la famille Mosselman, pour hâter le développement de ses exploitations, a mis en Société anonyme ses mines de zinc et ses établissements de Belgique et de France.

La Société de la Vieille-Montagne, constituée par arrêté royal du gouvernement belge, en date du 28 juin 1837, possède donc, à titre de propriétaire incommutable, une concession de mine de 8,500 hectares, qui, située originairement tout entière dans l'Empire fran-



çais, se compose aujourd'hui, par suite des traités de 1815, de trois parties respectivement belge, prussienne et neutre, sans que le changement de domination ait en rien affecté les droits des concessionnaires et les limites de la concession.

Le siège de la Société est à Liège, en Belgique.

La mine principale actuellement en exploitation est située à Moresnet, sur la route d'Aix-la-Chapelle à Liège.

D'autres gisements de minerais sont en exploitation, ou ont été reconnus à Walkenraedt, à Rabotraedt et sur divers autres points de la concession.

La production métallique de la Société, développée chaque année, depuis 1837, dans les établissements

de Liège,

d'Angleur, près Chénée,

de Moresnet,

de Valentin-Coq,

s'élève aujourd'hui à 12,000,000 de kilogrammes environ, soit à peu près un quart de la production totale du zinc.

Propriétaire d'établissements de laminage très-importants :

à Liège et à Tilf, en Belgique;

à Bray et au Houx, en France,

la Société de la Vieille-Montagne a fondé, pour l'écoulement des produits qui sortent de ses usines,

Des comptoirs : En France, à Paris, rue Richer, 19 ;

En Amérique, à New-York ;

En Angleterre, à Londres, 12, Manchester-Buildings, Westminster-Bridge; et dans toutes les principales villes elle a réparti des agences de vente, et compte plus de 200 dépôts de ses marchandises.

La Société de la Vieille-Montagne ne s'est pas contentée de produire et de fabriquer, elle a créé ou provoqué les applications si diverses auxquelles se prête le zinc, soit par des essais qu'elle a tentés directement elle-même, soit par un patronage officieux donné aux fabricants et aux ouvriers intelligents.

Elle a développé successivement la plupart des grandes applications du zinc, telles que la couverture des édifices, le doublage, clouage et chevillage des navires, la fonte des objets d'art et d'ornementation, etc.



C'est elle qui exploite aujourd'hui les brevets pour la fabrication du blanc de zinc, et qui propose l'emploi de cette nouvelle peinture en remplacement de la céruse.

Les spécimens de tous les principaux produits exposés aujourd'hui par la Vieille-Montagne, dans le palais de l'Exposition universelle, à Londres, disent assez les énormes progrès faits par l'industrie du zinc en moins de cinquante ans, progrès dont la famille Mosselman et la Société de la Vieille-Montagne, son successeur, osent revendiquer l'honneur.

### PRIX COURANT

#### DES MARCHANDISES EXPOSÉES A LONDRES

PAR LA SOCIÉTÉ DE LA VIEILLE-MONTAGNE.

#### ZINC LAMINÉ.

**Emplois divers pour toitures, terrasses, tuyaux, gouttières, réservoirs, travaux du bâtiment, ustensiles de ménage, etc.**

*Feuilles de zinc de 2<sup>m</sup> sur 80<sup>c</sup> du n° 10 au n° 26, à 65 fr. les 0/0.*

Feuilles de plus de 2 mètres de long et de plus de 80 centimètres de large, jusqu'à 4 mètres de long sur 1 mètre de large, selon commande et à des prix spéciaux.....

Le mètre courant de couverture, en n° 14, système à tasseaux, coûte..... 6 fr. 50 c.

Les mêmes feuilles servent pour :

- Mettre les murs à l'abri de l'humidité ;
- Recouvrir les escaliers extérieurs et de service ;
- Greniers à grains et à fourrages ;
- Planchers d'ateliers ;
- Mangeoires et râteliers ;
- Caisses d'emballage ;
- Caisses et barils à poudre ;
- Couvertures des voitures, tapissières et wagons.

Pour l'estampage et l'ornementation, auvents, marquises, etc., on se sert spécialement des n°s 12, 13, 14 et 15.

**Emplois pour le doublage des Navires, le chevillage et le clouage.**

Feuilles de 1<sup>m</sup>,15 sur 0<sup>m</sup>,55 des n<sup>os</sup> 15, 16 et 17, à 65 fr. les 0/0.

Id. de 1<sup>m</sup>,30 sur 0<sup>m</sup>,40 des n<sup>os</sup> 15, 16 et 17, à 65 »

Barres rondes pour chevillage de navires, de 8 à 41 millimètres de diamètre, à..... 65 fr. les 0/0.

Barres carrées pour la fabrication des clous à pont et à bordage, de 6 à 20 millimètres de côté, à..... 65 »

**Satinage des Papiers et des Étoffes.**

Feuilles sur commande, extra-fines, N<sup>o</sup> 10, à... 70 fr. les 0/0.

Id. id. N<sup>o</sup> 9, à... 90 »

Id. id. N<sup>o</sup> 8, à... 125 »

**Clous de Zinc.**

Semences pour tapisseries, de..... 200 à 100 fr. les 0/0.

Clous à bossettes, à pannes, à ardoises, à..... 100 »

Clous à doublage, à..... 80 »

Clous à pont et à bordage..... 90 »

Chevilles à pont..... 75 »

**Fil de Zinc.**

Fils de tous numéros, par bottes de 5 kilos chaque.

Le N<sup>o</sup> 1 à..... 98 fr. les 0/0.

et diminuant de 2 fr. par chaque numéro jusqu'au

N<sup>o</sup> 20, qui alors est du prix de..... fr. les 0/0.

**Emplois pour les Raffineries.**

Formes à sucre, contenant 12 litres chaque..... 2 fr. 50 c.

Id. id. 40 litres, »..... 7 50

Recouvrements de planchers, lits à pains, le mètre. 6 50

Réservoirs, caisses à cristallisation et à filtration, suivant les dimensions et les numéros.

**Objets divers.**

Modèles de couvertures variés.

Modèle de la couverture du comble de la gare de Strasbourg à Paris, exécuté par M. Jolly, entrepreneur de serrurerie.

Lucarne, grand modèle, ornée avec le zinc estampé. 80 fr. » c.

|                                                                      |                      |
|----------------------------------------------------------------------|----------------------|
| Lucarne en fonte de zinc (œil-de-bœuf) .....                         | 70 fr. » c.          |
| Baignoire à gorge polie, peinte et ornée.....                        | 200 »                |
| Mouleurs diverses en zinc plein, de ....                             | 1 à 15 fr. le mètre. |
| Id. en zinc creux.....                                               | 0,15 à 10 »          |
| Id. en zinc sur bois. ....                                           | 0,50 à 12 »          |
| Tubes agrafés de 5 millimèt. de diamètre, à 0,25 le mètre.           |                      |
| Id. de 11 centim. de diamètre, à 1 fr. 60 c. le mètre.               |                      |
| Petits bois pour vitraux, de 0,25 à 1 <sup>f</sup> ,50 le mètre.     |                      |
| Cordes en zinc pour le halage, de 0,50 <sup>e</sup> à 2 fr. le kilo. |                      |

#### Fonte de zinc.

Un mortier, bombes et obus, essayés à Metz par M. le général du génie Picot.

Pendules de plusieurs modèles, lustres, candélabres, flambeaux, bougeoirs, porte-allumettes, presse-papiers, etc.

|                                            |          |
|--------------------------------------------|----------|
| Pendule à la chèvre (sans mouvement) ..... | 55 fr. » |
| Pendule le Mot d'ordre.....                | 70 »     |
| Id. Jean-sans-Peur. ....                   | 14 »     |
| Candélabres dorés, la paire .....          | 1000 »   |

#### Fonte d'art.

|                                              |           |
|----------------------------------------------|-----------|
| Buste en zinc cuivré du Bacchus indien ..... | 350 fr. » |
| Id. de l'Ariane.....                         | 350 »     |
| Id. de l'ambassadeur du Népal,               |           |
| par Dantan aîné.....                         | 1600 »    |

Statue de Sa Majesté la reine d'Angleterre.

Modèle de la statue par M. Dantan aîné.

Dessin du piédestal par M. L. Lenormand, architecte.

Ornements exécutés par Hardouin, ornemaniste.

Fonte et ciselure sous la direction de V. Paillard, fabricant de bronzes.

#### Blanc de zinc.

Les blancs de zinc, en poudre.

|                                               |                 |
|-----------------------------------------------|-----------------|
| Prix, N° 1 .....                              | 65 fr. les 0/0. |
| N° 2.....                                     | 60 »            |
| 1 <sup>re</sup> qualité, blanc de neige. .... | 90 »            |

Spécimen de peinture, une porte d'intérieur d'appartement avec ornements en zinc.



# LISTE DES PRINCIPALES VILLES

dans lesquelles

SE TROUVENT DES DÉPÔTS DE ZINC DE LA VIEILLE-MONTAGNE.

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| Angers.         | Chalon-s-Saône.  | Gray.        | Mulhouse.    | St-Quentin.   |
| Angoulême.      | Châlons-s-Marne. | Havre.       | Nancy.       | Saumur.       |
| Arras.          | Charleville.     | La Rochelle. | Nantes.      | Sedan.        |
| Auxerre.        | Chartres.        | Le Cateau.   | Nevers.      | Soissons.     |
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| Bayonne.        | Cherbourg.       | Lille.       | Niort.       | Toulon.       |
| Beauvais.       | Clermont-Ferr.   | Limoges.     | Noyon.       | Toulouse.     |
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| Bourges.        |                  |              |              |               |

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## ESPAGNE.

Saint-Sébastien.

# REPORTS AND ANALYSIS OF WATNEY'S ANTHRACITE COAL.

| ANALYSIS BY DR. LYON PLAYFAIR. | REPORT BY DR. URE.                                                                                                          |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Carbon . . . . . 92.17         | This is the purest and most powerful sample of Anthracite I have ever examined.                                             |
| Hydrogen . . . . . 3.10        |                                                                                                                             |
| Oxygen . . . . . 2.22          |                                                                                                                             |
| Nitrogen . . . . . 1.08        |                                                                                                                             |
| Sulphur . . . . . 0.34         |                                                                                                                             |
| Ash . . . . . 1.09             | It is admirably adapted to <i>Making</i> purposes, and being nearly free from Sulphur it cannot injure the iron of Boilers. |
| <u>100.00</u>                  |                                                                                                                             |

*Experiments in GOVERNMENT BOILER, PUTNEY. The first being conducted by*  
*Dr. FRANKLAND, and the remainder by Sir H. DE LA BECHE and Dr. LYON PLAYFAIR.*

| DESCRIPTION OF FUEL.            | lbs. of Water evaporated by 1 lb. of Coal. | lbs. of Coal used per square foot of grate surface. | Area of Damper open. | Space in feet occupied by 1 Ton. | Cohesive power of Coal. | lbs. of Water evaporated per cubic foot of Coal. |
|---------------------------------|--------------------------------------------|-----------------------------------------------------|----------------------|----------------------------------|-------------------------|--------------------------------------------------|
| Watney's Anthracite . . . . .   | 11.92                                      | 12.10                                               | 56                   | 33.43                            | 87.5                    | 798.64                                           |
| Warlich's Patent Fuel . . . . . | 10.11                                      | 6.17                                                | 56                   | 32.44                            | ....                    | 698.09                                           |
| Duffryn . . . . .               | 10.14                                      | 8.06                                                | 112                  | 42.09                            | 56.2                    | 539.65                                           |
| Graigola . . . . .              | 9.35                                       | 9.45                                                | 49                   | 37.23                            | 49.3                    | 562.49                                           |
| Llangennech . . . . .           | 8.86                                       | 8.42                                                | 49                   | 39.34                            | 53.5                    | 504.39                                           |
| Wallsend . . . . .              | 8.85                                       | 6.87                                                | 56                   | 41.02                            | 64.0                    | 483.21                                           |

It will be perceived from the above Table that WATNEY'S Anthracite surpasses, to a very considerable extent, every coal which has been tried at this College in *Evaporative Power* as well as the following essential particulars :—

1. *Small Space* occupied by a given weight.
2. Great Cohesive Power.
3. Absence of Iron Pyrites.
4. Freedom from any considerable quantity of Sulphur and other Noxious Ingredients which afford a certain guarantee for its *Non-liability to Spontaneous Combustion*, and for its not corroding or destroying the *Boilers and*

*tubular Boilers* on account of the absence of any deposit in the tubes.  
 6. Its entire freedom from *Smoke* which is highly important to Ships of War in not betraying their position, and to all tubular Boilers on account of the absence of any deposit in the tubes.

**It may be seen in use for the boilers at the great Exhibition, Hyde Park, where total absence of smoke is indispensable, and also at the Distillery at Wandsworth.**

(Signed) E. FRANKLAND, Ph. D. F. C. S.

College for Civil Engineers,  
 PUTNEY, Dec. 28th, 1850.



**Arkansas Oilstone,**  
(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones** No. No. No.

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

approx. 100 upwards as per N. 100

THESE REMAINING HONES FOR RESAVERS' USE  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones,** No 1—4 inches

2—6 "

**Resaw Hones** with 3—8 "

MADE IN AUSTRIA

MADE IN AUSTRIA



# RAW MATERIALS.

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## CLASS II

CHEMICAL AND PHARMACEUTICAL PRODUCTS.

**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones**

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

THE BEST LAMINATING BLOCK FOR LANCET & SHOT  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones, No 1—4 inches**

2—6 "

3—8 "

**Razor Hones** with 3—8 "

Great Exhibition, No. 26, Class 2.

---

**GEORGE CLIFFORD,**  
**5, Inner Temple Lane, Temple,**  
**RESTORER & REPAIRER**  
OF  
**DEEDS, WRITINGS, BOOKS, MAPS, PLANS,**  
**ENGRAVINGS, DRAWINGS, PAPER & PARCHMENT,**  
**IN GENERAL.**

---

**THE SPECIMENS EXHIBITED SHOW—**

AN INDENTURE THAT WAS TAKEN FROM THE RUINS OF THE GREAT FIRE AT LINCOLN'S INN, January 14th, 1849. The restored half, (*without having been separated from the dirty half*) cleansed, flexibility being imparted to it; it having been hard, horny and brittle, from the effect of the fire and water, any ordinary attempt to open it breaking it. The writing having sustained no injury.

TWO LEAVES OF A BOOK, AND TWO LEAVES OF THE "JURIST" NEWSPAPER, and other portions of Parchment, taken from the same Fire, which have been injured by fire and water, &c.

A MAP, AND SEVERAL ENGRAVINGS, injured by age, smoke, mildew, water and dirt, &c., the whole having been in the dirty state,—the halves cleansed.

---

MR. CLIFFORD begs to draw the attention of the public to the advantages attending the process discovered by him of Cleaning, Restoring and Repairing Paper and Parchment injured by different causes, without any detrimental effect to either the Paper, Parchment, or Ink; on the contrary, his process imparts flexibility to Parchment, and strength to Paper; Parchment injured by fire and other causes becoming so brittle that it is impossible to open it, and Paper losing its strength. The process has been tested for the satisfaction of the Jury, and was also employed on many of the documents recovered from the great Fire at Lincoln's Inn, giving entire satisfaction.

Waterlow & Sons Printers, Carpenters' Hall London Wall, and at the Crystal Palace, Hyde Park.



**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones** .....

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

THE BEST FINISHING STONE FOR LANCETS AND  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade.*

**Lancet Hones,** No 1—4 inches

2—6 "

"

**Razor Hones** with 3—8 "

# REPORTS AND ANALYSIS OF WATNEY'S ANTHRACITE COAL.

| ANALYSIS BY DR. LYON PLAYFAIR.                                                                                                                | REPORT BY DR. URE.                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Carbon ..... 92.17<br>Hydrogen ..... 3.10<br>Oxygen ..... 2.22<br>Nitrogen ..... 1.08<br>Sulphur ..... 0.34<br>Ash ..... 1.09<br><hr/> 100.00 | This is the purest and most powerful sample of Anthracite I have ever examined.<br><br>It is admirably adapted to <i>Making</i> purposes, and being nearly free from Sulphur it cannot injure the iron of Boilers. |

*Experiments in GOVERNMENT BOILER, PUTNEY. The first being conducted by Dr. FRANKLAND, and the remainder by Sir H. DE LA BECHE and Dr. LYON PLAYFAIR.*

| DESCRIPTION OF FUEL.  | lbs. of Water evaporated by 1 lb. of Coal. | lbs. of Coal used $\frac{1}{2}$ square foot of grate surface. | Area of Damper open. | Space in feet occupied by 1 Ton. | Cohesive power of Coal. | lbs. of Water evaporated $\frac{1}{2}$ cubic foot of Coal. |
|-----------------------|--------------------------------------------|---------------------------------------------------------------|----------------------|----------------------------------|-------------------------|------------------------------------------------------------|
| Watney's Anthracite   | 11.92                                      | 12.10                                                         | 56                   | 33.43                            | 37.5                    | 798.64                                                     |
| Warlich's Patent Fuel | 10.11                                      | 6.17                                                          | 56                   | 32.44                            | ....                    | 698.09                                                     |
| Duffryn               | 10.14                                      | 8.06                                                          | 112                  | 42.09                            | 56.2                    | 539.65                                                     |
| Graigola              | 9.35                                       | 9.45                                                          | 49                   | 37.23                            | 49.3                    | 562.49                                                     |
| Llangennech           | 8.86                                       | 8.42                                                          | 49                   | 39.34                            | 53.5                    | 504.39                                                     |
| Wallsend              | 8.85                                       | 6.87                                                          | 56                   | 41.02                            | 64.0                    | 483.21                                                     |

It will be perceived from the above Table that WATNEY'S Anthracite surpasses, to a very considerable extent, every coal which has been tried at this College in *Evaporative Power* as well as the following essential particulars:—

1. *Small Space* occupied by a given weight.
2. Great Cohesive Power.
3. Absence of Iron Pyrites.
4. Freedom from any considerable quantity of Sulphur and other Noxious Ingredients which afford a certain guarantee for its *Non-liability to Spontaneous Combustion*, and for its not corroding or destroying the *Boilers and Fire-bars* exposed to its action.
5. *Quickness of Action*, that is, Quantity of Steam generated per hour per Square Foot of Fire-Grate Surface so as fully to entitle it to the character of a *Free Burning Coal*.
6. Its entire freedom *from Smoke* which is highly important to Ships of War in not betraying their position, and to all tubular Boilers on account of the absence of any deposit in the tubes.

**It may be seen in use for the boilers at the great Exhibition, Hyde Park, where total absence of smoke is indispensable, and also at the Distillery at Wandsworth.**

(Signed) E. FRANKLAND, Ph. D. F. C. S.

College for Civil Engineers,  
PUTNEY, Dec. 28th, 1850.

**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones**

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Square, Gouges, Parting Tools, &c.

the best finishing stone for razors and  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*,

**Lancet Hones**, No 1—4 inches

2—6 "

"

**Razor Hones** with 3—4 "



**COLLINS'S**  
**PATENT DISINFECTING POWDER,**  
For the Instantaneous Destruction of  
**OFFENSIVE SMELLS,**

AND

FOR PURIFYING THE AIR,

THEREBY PREVENTING

FEVERS, INFLUENZA, CHOLERA, & INFECTIOUS DISEASES.

The researches of the most eminent chemists, and the experience of medical practitioners, have established the fact, that when free Chlorine is suitably applied, the propagation of malignant fevers and other contagious disorders is prevented, and the determining causes of CHOLERA are destroyed; consequently, the spread of these devastating maladies is arrested. The effect of free CHLORINE, in destroying offensive smells, is instantaneous.

The obstacles to the universal adoption of Chlorine, for such purposes, have hitherto been its costliness, and the inconvenience of existing means for its application. These obstacles are completely removed by "COLLINS'S DISINFECTING POWDER," which is a cheap Preparation, and is so compounded as to give off *free* Chlorine with the greatest facility and certainty, when it is exposed, either to the atmosphere, or under such other circumstances as to cause it to absorb moisture. In this respect it possesses most important advantages over "Chloride of Lime," in which the *Chlorine* is in a *state of combination*, and therefore nearly inert; and over the "Liquid Deodorizers," such as the Solutions of Zinc, Lead, Iron, &c. which only produce their deodorizing effect when mixed with the mass of offensive matters, or when the deleterious effluvia actually come into contact with the surface of the "liquid" exposed.

The Patent Disinfecting Powder is not only the most economical *Deodorizer*, but a most perfect *Disinfectant*; for the Chlorine which it gives off possesses the power of intimately mingling with the atmosphere surrounding putrid or offensive matters, and of converting the pestilential exhalations arising therefrom into chemical compounds devoid of all baneful properties.

This Powder is, therefore, useful for purifying the air in all situations where persons are congregated without sufficient ventilation, or wherever injurious exhalations exist. It is also particularly applicable for instantaneously destroying all kinds of noxious smells.

If injurious or offensive exhalations pervade any apartment, it is only needful to expose some of the Powder in an open vessel, when the absorption of moisture from the atmosphere occasions a *gradual* and *continuous* extrication of Chlorine, which mingles with and purifies the surrounding air. If the effluvia arise from any collection of offensive matter, such as a cesspool, a dust-heap, &c. a little Powder thrown upon the surface causes a *rapid* evolution of Chlorine, which will completely destroy the deleterious exhalations.

The varied applications of this powder are extremely simple, and attended with little trouble; its effects are certain, and almost instantaneous; and its cost is so trifling, as to place it within the reach of the poorer members of the community.

A few particulars of the various modes in which the Powder may be employed are subjoined.

**Directions for Use.**—Place a few table-spoonfuls of this Powder in a wide-mouthed bottle or jar, where noxious exhalations or offensive smells exist. When the odour of the Powder becomes perceptible in the apartment, all pernicious effluvia are destroyed, in which case partially or wholly close the box or jar with the stopper or cork, re-opening it as occasion may require. Whenever the Powder is used, it settles to exert its purifying influence, stir it, or throw a small quantity so as to expel it from the surface to the air. If the smells be very disagreeable, put a little of the Powder into a small glass, or a tumbler or a plate, and should the smells not be quickly removed, add a few drops of water to the Powder exposed in that tumbler or plate; but generally the *moisture* of the atmosphere will suffice. Experience will soon decide the quantity of Powder to be used.

This mode of using the Powder is particularly suitable for Sick-rooms, Hospitals, Courts of Justice, School-rooms, Ships'-cabins; Work-shops, Crowded Assemblies, Provision Warehouses, Public Markets, &c. Also for Water-closets, Urinals, Drains, Stables, Cattle-sheds, Menageries, Dog-kennels; for Ships, carrying offensive cargoes, such as bones, hides, guano, whale-blubber, &c. and for all places where the air requires purification.

Into all cesspools and other collections of offensive matters, throw a small quantity of the Powder daily; by which precaution the escape of any pestilential or offensive effluvia will be prevented, and the quality of the manure improved.

This method of application is suitable for Privies, Manure-tanks, Sewers, Stagnant-ditches, Bilge-water, Dust and Dung-heaps, &c. Also for the refuse, &c., unavoidably collected upon the premises of Butchers, Fishmongers, Poulterers, Tallow-melters, Slaughterers, Bone-boilers, Glue-makers, &c.

A tea-spoonful of the Powder thrown into a night-pan or a chamber vessel, *previously* to its being used, effectually prevents any disagreeable smell. A similar quantity may be so employed to destroy effluvia arising from Cabbage-water, &c. Its use in Bed-rooms, Nurseries, and Kitchens, is, therefore, obvious.

By placing the Powder in Coffins, Mausoleums, &c., the possibility of smell and the danger of infection are prevented.

The Powder does not contain any metallic or poisonous substance; it will not stain linen; nor is its application confined to the destroying of offensive smells and pestilential exhalations, for it may be placed in a little in Stores or Larders where Potatoes, &c. are kept, to prevent the progress of rot, and to keep them sweet. The Powder is likewise useful in Taverns, &c. as it destroys all disagreeable smells arising from Tobacco Smoke, Cooking, &c. For many other purposes for which "Solutions of Chlorine" are employed, such as Bleaching, &c. To remove stains from linen, by adding half a pint of water, produces a strong "BLEACHING LIQUOR," which may be used on all sorts of linen, mildew, &c. from linen, cottons, muslins, lace, and leather; also the yellow spots on the surface of the skin, and the stains of fruit, &c. will be taken off, by applying some of the Bleaching Liquor to the linen, &c. add a quart of water to a table-spoonful of the Powder, and soak the articles in it for twelve or twenty-four hours. A stain may be immediately removed by wetting it with water, and then placing upon it a little of the Powder, as soon as the stains are removed, or the bleaching is completed, the linen, &c. should be well rinsed in clean water.

PATENTEE, R. N. COLLINS, WHOLESALE DRUGGIST,  
OXFORD COURT, CANNON STREET, LONDON.

Sold by Druggists and Oilmen.—Price 6d.—1s.—1 1/6 and 3s.

[For Testimonials, see other side.]



The best, finishing, alone for  
use, with Shaw Cards, for the Trade.

Lancet Hones, No 1—4 inches

2-6

3-4

Razor Hones) with 3-4

Circular Wheels

Slips and Pencils.

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

Arkansas Oilstone.

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In Hones

## The following are selected from numerous Testimonials.\*

"COLLINS'S DISINFECTING POWDER is so compounded as to give off free chlorine gas upon exposure to moisture, whether that of the air, or by admixture with water; and thus it becomes a DE-ODORANT OF ALL NOISOME SMELLS arising from putrid animal or vegetable matter, AND A DIS-INFECTANT FROM CHOLERA. I have witnessed several experiments upon it as a de-odorant, and find that from a quarter to half an ounce completely and instantly destroys the stench from the most disgusting privy; the public will thus be enabled to judge of its efficacy in destroying the nuisances, and preventing infection in a sick room. Its use for disinfecting purposes is attended with the greatest facility and convenience.

"W. HERAPATH, Philosophical Chemist."

The quantity of the Powder stated by Mr. Herapath, as sufficient for instantly destroying the most disgusting stench, is about one table-spoonful, which costs less than a half-penny.

"I have been requested to examine and report upon the properties of COLLINS'S DISINFECTING POWDER; and to enable me to express my opinion fully and confidently, I have attended the performance of a number of trials of this Powder as a disinfecting agent. As respects the chemical constitution of this material, I find it is so compounded that the simple absorption of moisture occasions the evolution of Chlorine. This evolution being gradual and continuous, may be so regulated by the quantity of Powder exposed, as to yield a greater or smaller amount of this gas, as may be found requisite.

"The properties of Chlorine, as a disinfecting agent, have been long known and highly estimated by medical authorities; and I wish to direct attention to the advantages which it possesses in consequence of its gaseous form, which enables it rapidly to mix with the polluted atmosphere surrounding animal and vegetable matter in a state of decomposition, and to destroy the fetid and noxious gases contained in such atmosphere.

"As a means of furnishing a supply of Chlorine, for sanitary purposes, COLLINS'S POWDER presents great advantages over 'chloride of lime,' from which it is impracticable, under ordinary circumstances, to obtain a gradual and continuous supply of this gas. Its action as a de-odoriser being effected by its gaseous element, it is much to be preferred to the 'liquid de-odorants,' which require to be intimately mixed with the offensive matter to produce the desired effect.

"The trials I have witnessed with COLLINS'S DISINFECTING POWDER consisted in the de-odorisation of most offensive privies, of collections of organic matter undergoing decomposition in ash pits, of accumulations of garbage and blood in an advanced state of decomposition in slaughter-houses. In all these cases the result of the application of this Powder was highly satisfactory.

"R. H. BRETT, Ph.D., F.L.S.,

"Lecturer on Chemistry and Medical Jurisprudence."

"Having been applied to for our opinion of Mr. COLLINS'S DISINFECTING POWDER, which we have for some time past been employing in the Droitwich Lunatic Asylum, we have no hesitation in stating, that we have found it the most effectual deodorizing agent we have ever made use of; and that we consider it a most important discovery for producing a continuous extrication of chlorine gas, by which offensive exhalations are quickly removed.

"MARTIN RICKETTS, F.R.C.S.E.

"CHARLES HASTINGS, M.D."

"Having tried the effect of THE DISINFECTING POWDER in several instances, both in the case of decomposing animal substances, and of offensive smells in sick and ill-ventilated rooms, and those arising from drains, &c. I can speak most highly of its efficiency. In one instance, I particularly remarked that the peculiarly offensive odour from a case of cancer, which the chloride of lime failed to correct, was entirely destroyed by merely removing the cork from a bottle of the powder placed in the apartment. Now that so much attention is directed to noxious and offensive gases—being the fertile cause of illness—it is almost unnecessary to add, that no house or establishment should be without it.

"DE BERDT HOVELL, Surgeon."

"Mr. COLLINS,—Sir,—I have extensively tried your DISINFECTING POWDER, and bear testimony to its efficiency in the removal of unpleasant odours, such as are found in fever and cholera wards. I have also experienced the good effects arising from its use in privies and stinking drains, and am of opinion that a knowledge of its powers cannot be too generally disseminated.

"It is so portable a powder, and the directions for its use so simple, and its price so cheap, that I would recommend its use in all places in which large numbers of human beings are congregated; and in the houses of the poor generally. I am, Sir, your obedient servant,

"JAMES CLARK, Surgeon."

"Having had my attention directed to COLLINS'S DISINFECTING POWDER as a deodorizing agent, I suggested that a trial of its efficacy should be made at some most offensive privies in this city; when its capability of instantly destroying noxious effluvia was proved to my entire satisfaction. This effect was produced by merely throwing a small quantity of the Powder into the collection of soil.

"JOSEPH BENNETT,

"Chairman of the Board of Guardians of the Worcester Union."

"Having used COLLINS'S DISINFECTING POWDER on my own premises, and having attended some extensive trials made with it by the Medical Officer of the Droitwich Union, together with a Committee appointed by the Board of Guardians 'under the Public Health Act,' I feel called upon to testify to its perfect efficacy in instantaneously destroying noxious smells; and, as it effects a trifling cost, and with so little trouble, I consider that its capabilities should be universally adopted at this period, when the destruction of nuisances is so important to the public health.

"J. H. BRADLEY, Mayor of Droitwich."

"The members of the Bromsgrove Union, have witnessed the benefits of Mr. COLLINS'S DISINFECTING POWDER, and are satisfied it is the most powerful agent we have met with for the speedy and effectual removal of effluvia arising from privies, drains, dead animal matter, &c. and for purifying infected and unhealthy houses.

"T. S. FLETCHER, M.R.C.S.

JOS. HORTON, M.R.C.S.

JOHN TOWNSEND,

WILLIAM WYATT, } Relieving Officers.

SAMUEL CLARKE, Governor."

\* With three exceptions, the whole of the Testimonials here selected were received by the Patentee in the course of a few weeks.



"Nassau, West Indies.

"Dear Sir,—In reference to your request for my opinion of your 'Disinfecting Powder,' I would have replied sooner, but I was anxious to have opportunities of testing its qualities. Lately I have had several good opportunities, and the result has been most favourable. In a recent case of the exhumation of a body by order of the Coroner, I used the Powder, which completely neutralized the offensive effluvia. I consider it a very valuable and useful preparation.

"To R. N. COLLINS, Esq."

"WM. KIRKWOOD, M.D.

"Our attention having been specially directed to a searching investigation of the various de-odorizing preparations, we are of opinion that COLLINS'S DISINFECTING POWDER is decidedly the best for family use and for sanitary purposes in general.

"As the principal 'liquid deodorants,' though highly poisonous, present the appearance of clear water, their use in the nursery and sick-room is not free from danger; the form of a dry powder has, therefore, many advantages, especially when the compound evolves its purifying properties either *instantaneously*, or *gradually and continuously*, as may be required.

"The great merit of Mr. COLLINS'S chemical discovery (its extreme cheapness alone excepted) consists in the facility, certainty, and safety with which even the most inexperienced person is enabled to employ the de-odorizing and dis-infecting powers of Chlorine for domestic and sanitary purposes.

"The application of such de-odorizers as contain zinc, lead, and iron, to substances intended for *manuring* land, is most injurious. COLLINS'S POWDER, on the contrary, fixes the volatile and offensive products forming soluble ammoniacal and other salts, thus producing chemical compounds free from effluvia; and which are not only harmless, but of a valuable and highly fertilizing nature.

"HEATHFIELD AND BURGESS,

"Manufacturing and Analytical Chemists."

"Dear Sir,—I have tried your de-odoriser on a large cesspool of long standing, and on a small scale, with atmosphere impregnated with sulphuretted hydrogen gas; in both instances the odour was almost immediately destroyed. In consequence of the powder containing no poisonous or heavy metallic salt, it is more valuable than any other de-odoriser known, both for domestic and general purposes; and, at the same time, *will enhance the quality of MANURES* with which it has been mixed.

"J. H. S. WILDSMITH, Analytical Chemist,

"Lecturer to Hoddesdon Agricultural College."

"Having had repeated opportunities of proving the extraordinary efficacy of a very small quantity of COLLINS'S DISINFECTING POWDER in destroying noxious stench, I have much satisfaction in testifying to its merits, both as respects the simplicity and convenience of its use, and its cheapness; also in recommending it to the public, for general use, where nuisances prevail.

"WILLIAM SAYER,

"Inspector of Nuisances for the city of Bristol."

"Mr. COLLINS,—Sir,—I have used your Composition in my slaughter-houses for the last month, and find it destroys any offensive smell that arises, in one minute. I have had many gentlemen in my premises, to try experiments; but none had the effect that your composition has. Whenever an offensive smell arises, I throw a small quantity of the Powder down, and the smell is lost in one minute. I have tried it also in my private water-closets, and it has the same effect; and I should always wish to have some of it in my house.

"Yours respectfully,

"C. GARDNER."

"Barque 'Eliza,' from Rio Grande, with a cargo of Ox Hides and Horns.

"Sir,—In accordance with your request I have tested the efficacy of COLLINS'S POWDER in destroying the disgusting smell emitted from cargoes similar to the above named; and, in the presence of a medical practitioner and several other gentlemen, I found it, in an incredibly short time, entirely annihilated.

"I further beg to remark, as you seek the more immediate benefit of those connected with shipping, that the men working in the hold were delighted on the application of this powder; and, to prove whether its virtues soon evaporated or otherwise, the Customs' Officer under your supervision and myself descended into the hold, when the night had far advanced, but could not detect the least smell of the hides, &c.

"WILLIAM ABERNETHY, Master.

"To C. A. DAVIS, Esq., Tide Surveyor, H. M. Customs, Port of Bristol."

"I have much pleasure in stating that the barque 'Peruvian,' has been completely purified by the use of COLLINS'S DISINFECTING POWDER, and that this was effected by merely exposing this Powder in the hold, after having discharged the cargo and washed out the ship. My cargo consisted of 642 tons of GUANO, consigned to Messrs. Gibbs, Bright, and Co., and the vessel is now so thoroughly purified that she is fit to receive any cargo.

"W. H. BRUCE, Master."

"The results of our trials of COLLINS'S DISINFECTING POWDER, for destroying the offensive smell of BILGE-WATER in the 'Jaseur,' have given us satisfaction; please to send eight jars of the 3s. size for the use of the said vessel on her African voyage.

"LUCAS, GWYER, & CO."

"I hereby certify that the brig 'Catharina' has just been discharged of 210 tons of VALONIA, from Smyrna; and that during the discharge a most overpowering smell was emitted from some part of the cargo which had become damaged, until COLLINS'S POWDER was used in the hold, when the smell was completely destroyed.

"JNO. DRYSDALE, Master."

"It affords me considerable pleasure to communicate the successful results of an experiment with Collins's preparation of Chlorine upon very offensive BILGE-WATER, generated from a cargo of Sugar and Molasses on board the 'Eliza;' which, in this instance, is rendered much worse by the tightness of the ship. Ere we commenced pumping, we introduced down the starboard pump one 3s. jar of COLLINS'S POWDER, and upon the bilge-water being then pumped off, not the slightest disagreeable smell was perceptible.

"THOMAS ALLEN, Master.



**Arkansas Oilstone,**  
(For Gravers, &c.)  
Immensely hard, pure and fine cutting.  
**In Bones**

R. N. COLLINS, PATENTEE, OXFORD COURT, CANNON STREET, LONDON.





**COLLINS'S**  
**PATENT DISINFECTING POWDER,**  
 For the Instantaneous Destruction of  
**OFFENSIVE SMELLS,**  
ARISING FROM  
**BILGE WATER,**  
 AND FOR PURIFYING SHIPS,  
 CARRYING CARGOES OF BONES, HIDES, GUANO, WHALE-BLUBBER, &c.

Medical practitioners and eminent chemists have proved, that *free* Chlorine destroys offensive smells, and purifies the air; thus preventing **FEVERS, CHOLERA,** and other malignant or contagious disorders. Its great value, especially in hot climates, is obvious.

**COLLINS'S PATENT DISINFECTING POWDER** is superior to "Chloride of Lime," and to all "Liquid Deodorizers;" because, when allowed to absorb **MOISTURE**, it gives off free Chlorine with the greatest facility and certainty. By means of this Powder, every person can quickly destroy offensive smells, and purify the air, wherever this is found necessary.

**COLLINS'S DISINFECTING POWDER** is peculiarly adapted for destroying the offensive smell of *Bilge Water*, for purifying Ships' Cabins, and for cleansing the Holds of Vessels. Its use so materially adds to the comfort of a ship's crew, that no sea-going vessel should be without it. For Ships carrying Emigrants, Troops, or Convicts, (especially when there are children) it will be found of essential service. In times of sickness it is invaluable; but the numerous other purposes to which it may be applied, make it emphatically an article of **DAILY UTILITY**, and more particularly in tropical climates.

**COLLINS'S POWDER** does not contain any metallic or poisonous substance; and may be safely used by the most inexperienced person. Its application is of the simplest character—its effects being solely regulated by the quantity exposed, and the degree of moisture applied. If sprinkled upon any wet surface, its purifying powers are *rapidly* set free; but, if it be merely exposed to the atmosphere, the liberation is *gradual* and *continuous*. For example:—

Offensive smells arising from *Bilge Water*, &c. are immediately destroyed by throwing in a little of the Powder; and a place contaminated with infection or bad smells, is quickly purified by placing in it an uncorked bottle of the Powder, or by exposing a small quantity in any open vessel, such as a jar, a tumbler, or a plate. In the one case, the *dampness* rapidly extricates the purifying powers of the Powder, and the offensive smells are instantly destroyed; and in the other, the *moisture of the atmosphere* causes a gradual and continuous liberation of the Chlorine, which mingles with and purifies the contaminated air. When the odour of the Powder pervades the place where it is used, the infection and bad smells are destroyed.

### Directions for Ships' Use.

**FOR DESTROYING THE SMELL OF BILGE WATER.**—Draw the sucker and box of one of the pumps, put in about a pint of the Powder, wash it down into the bilge with a few pails of water, then pump out with the other pump. The Powder should be increased or diminished according to the quantity and offensiveness of the bilge water—using sufficient to destroy the smell.

**FOR PURIFYING THE AIR IN CABINS, WATER-CLOSETS, &c.**—Place two or three table-spoonfuls in any open vessel, such as a jar, a tumbler, or a plate, where infection or offensive smells exist. If the smells be not quickly removed, add a few drops of water; but generally the *moisture of the atmosphere* will suffice. A tea-spoonful of the Powder thrown into a night-pan or a chamber vessel, *previously* to its being used, effectually prevents any disagreeable smell. When the odour of the Powder becomes perceptible in the place where it is used, the infection and bad smells are destroyed—the Powder should then be covered over, or removed.

**FOR LOADING OR DISCHARGING OFFENSIVE CARGOES.**—Place a few pounds of the Powder upon the timbers and cross-beams of the vessel, and all disagreeable smells will be destroyed as they arise. Use a larger or smaller quantity of the Powder according to the offensiveness of the cargo.

**FOR CLEANSING SHIPS WHEN DISCHARGED.**—After clearing out the hold, place the Powder upon the cross-beams and timbers; close the hatches, and the ship will soon be purified.

In the case of Guano, it is not advisable to use the Powder in the hold whilst the men are there working the cargo; but, after the ship has been washed out, the smell of the Guano may be completely removed by spreading the Powder upon the timbers, &c, as above directed.

Full particulars of the varied applications of **COLLINS'S POWDER** for Household and other purposes, with numerous testimonials from eminent Physicians, Surgeons, Chemists, Ship-owners, Manufacturers, and others, are given with each package.

**R. N. COLLINS, WHOLESALE DRUGGIST,**  
 PATENTEE,  
 OXFORD COURT, CANNON STREET, LONDON.



**Arkansas Oilstone,**  
(For Gravers, &c.)  
Immensely hard, pure and fine cutting.  
In **Hones**

**Circular Wheels**  
**Slips and Pencils.**  
Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

for best finishing, more for private and  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.  
**Lancet Hones,** No 1—4 inches  
" 2—6 "  
**Razor Hones** with 3—5 "



**COLLINS'S**  
**PATENT DISINFECTING POWDER,**  
 For the Instantaneous Destruction of  
**OFFENSIVE SMELLS,**  
 AND  
**FOR PURIFYING THE AIR,**  
 THEREBY PREVENTING  
 FEVERS, INFLUENZA, CHOLERA, & OTHER INFECTIOUS DISEASES.

Medical practitioners and eminent chemists have proved, that *free Chlorine* destroys offensive smells, and purifies the air; thus preventing **FEVERS, CHOLERA**, and other malignant or contagious disorders. Its great value, especially in hot climates, is obvious.

**COLLINS'S PATENT DISINFECTING POWDER** is a cheap preparation; and, when allowed to absorb *moisture*, it gives off *free Chlorine* with the greatest facility and certainty. The means for instantaneously destroying all kinds of offensive smells, and for purifying the air in all situations, are thus placed within the reach of every person. It is superior to "*Chloride of Lime*," and to all "*Liquid Deodorizers*."

**COLLINS'S DISINFECTING POWDER** is an article of *daily utility*, and it ought to be found in every dwelling. It is invaluable for Nurseries and Sick-rooms. Also for keeping Stores and Larders perfectly sweet, for making "*BLEACHING LIQUID*," and for various other household purposes. *A Sixpenny Package is sufficient for a Month's domestic use.*

**COLLINS'S POWDER** does not contain any metallic or poisonous substance; and may be safely used by the most inexperienced person. Its application is of the simplest character—its effects being solely regulated by the quantity exposed, and the degree of moisture applied. If sprinkled upon any wet surface, its purifying powers are *rapidly* set free; but, if it be merely exposed to the atmosphere, the liberation is *gradual and continuous*. For example:—

Offensive smells arising from Cesspools, Drains, &c., are immediately destroyed by throwing in a little of the Powder; and a room contaminated with infection or bad smells, is quickly purified by placing in it an uncorked bottle of the Powder, or by exposing a small quantity in any open vessel, such as a jar, a tumbler, or a plate. In the one case, the *dampness* rapidly extricates the purifying powers of the Powder, and the offensive smells are instantly destroyed; and in the other, the *moisture of the atmosphere* occasions a gradual and continuous liberation of the Chlorine, which mingles with and purifies the contaminated air. When the odour of the Powder becomes perceptible in the place where it is used, the infection and bad smells are destroyed.

The sanative effects of **COLLINS'S DISINFECTING POWDER** have been fully tested in government, municipal, and public offices; and its general use in Courts of Justice, Prisons, Hospitals, Workhouses, School-rooms, Workshops, and Crowded Assemblies, would be productive of most beneficial results to the whole community.

Butchers, Fishmongers, Poulterers, Cheesemongers, and other Traders, are enabled by **COLLINS'S POWDER** immediately to destroy any disagreeable effluvia that may arise from unavoidable collections of refuse animal or vegetable matter; thus keeping their shops perfectly sweet, and their goods free from *taint*. The unpleasant smells common to Public Markets and Provision Warehouses, and any objectionable smell from Tobacco-smoke in Taverns and Smoking-rooms, may likewise be prevented.

Agriculturists, Farmers, Gardeners, and others, will find **COLLINS'S POWDER** of the utmost utility; for it possesses the property of fixing the "*Ammonia*" in *manures*, while it prevents those injurious exhalations which invariably arise in Stables, Cattle-sheds, Menageries, Dog-kennels, &c.

Ship-owners, Captains, Emigration-agents, and others, will also find the **PATENT DISINFECTING POWDER** of the greatest service, for purifying the air in Ships' Cabins, for destroying the smell of *BILGE-WATER*, and for *Cleansing the Holds of Vessels*—especially those carrying offensive cargoes, as Bones, Hides, Guano, &c.

Commissioners of Sewers, and Inspectors of Nuisances, by means of this Powder, may restrain the escape of poisonous effluvia from Public Sewers, Dust-heaps, and Stagnant Waters; as also those very offensive smells arising from the premises of Tallow-melters, Slaughterers, Bone-boilers, Glue-makers, &c.

Undertakers and others can prevent the possibility of smell and the danger of infection, by putting some of the Powder in Coffins, in places where the dead are deposited previous to interment, and in Cemeteries.

Full particulars of the varied applications of **COLLINS'S POWDER** for Household and other purposes, with numerous testimonials from eminent Physicians, Surgeons, Chemists, Ship-owners, Manufacturers, and others, are given with each package.

**R. N. COLLINS, WHOLESALE DRUGGIST,**  
**Patentee,**  
**OXFORD COURT, CANNON STREET, LONDON.**

By Druggists & Oilmen.

Price 6d. 1/- 1/6 & 3/-



**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting-

**in Hones**

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

ALL OUR THINNING TOOLS FOR ANVILS, GRIND-  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones, No 1—4 inches**

2—6 "

2—6 "

**Razor Hones** with 3—8 "



Oxford Court,  
Cannon Street,  
London.

Sir,

I forward with this a small package of my Patent Disinfecting Powder; and beg your attention to the statement of its properties contained on the other page, soliciting also a trial of its powers.

I shall be happy to send you (without charge) a larger quantity of this New Chemical Compound, for any further experiments you may desire to make, in proof of its peculiar efficacy for destroying Offensive Smells, and purifying Contaminated Air.

I remain, Sir,

Yours, respectfully,

L<sup>d</sup> Collins

P. S.—The Powder will be found invaluable for Nurseries and Sick-chambers. A tea-spoonful thrown into a night-pan, previously to its being used, effectually prevents any disagreeableness. This statement admits of easy proof.

[Turn over.]



## COLLINS'S PATENT DISINFECTING POWDER.

The sanative effects of COLLINS'S DISINFECTING POWDER have been fully tested in government, municipal, and public offices; and its general use in Courts of Justice, Prisons, Hospitals, Workhouses, School-rooms, Workshops, and Crowded Assemblies, would be productive of most beneficial results to the whole community.

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R. N. COLLINS, PATENTEE, OXFORD COURT, CANNON STREET, LONDON.  
Sold by Druggists and Oilmen. Price 6d. 1/- 1/6 and 3/-



**COLLINS'S**  
**PATENT DISINFECTING POWDER,**  
 For the Instantaneous Destruction of  
**OFFENSIVE SMELLS,**  
 AND  
**FOR PURIFYING THE AIR,**  
 THEREBY PREVENTING  
 FEVERS, INFLUENZA, CHOLERA, & OTHER INFECTIOUS DISEASES.

THE researches of eminent chemists, and the experience of medical practitioners, have proved that FREE CHLORINE instantaneously destroys offensive smells; and that its suitable application arrests the progress of malignant FEVERS, destroys the determining causes of CHOLERA, and thus prevents the propagation of devastating or contagious maladies.

The obstacles to the universal adoption of Chlorine for such purposes have hitherto been its costliness, and the inconvenience of existing means for its application.— These obstacles are completely removed by "COLLINS'S DISINFECTING POWDER," which is a cheap Preparation; and is so compounded as to give off *free* Chlorine, with the greatest facility and certainty, when it is allowed to absorb MOISTURE. In this respect it possesses most important advantages over "Chloride of Lime," in which the Chlorine is in a *state of combination*, and therefore nearly inert; and over all "Liquid Deodorizers" (such as the Solutions of Zinc, Lead, Iron, &c.) which only produce deodorizing effects when mixed with the mass of offensive matters, or when the deleterious effluvia actually come into contact with the "Liquid" exposed.

The Patent Disinfecting Powder is not only the cheapest *Deodorizer*, but the most perfect *Disinfectant*; for the Chlorine which it gives off possesses the power of intimately mingling with the noxious exhalations arising from putrid or offensive substances, and of converting these exhalations into chemical compounds devoid of all baneful properties.

COLLINS'S DISINFECTING POWDER is an article of *daily* utility, and it ought to be found in every dwelling. It is invaluable for Nurseries, and Sick-rooms. Also for keeping Stores and Larders perfectly sweet, for making "Bleaching Liquid," and for various other household purposes. *A Sixpenny Package is sufficient for a Month's domestic use.*

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R. N. COLLINS, WHOLESALE DRUGGIST,  
 PATENTEE,  
 OXFORD COURT, CANNON STREET, LONDON.



**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones** .....

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

The best rubbing-hone for razors and  
Lancets, and admirably adapted for private  
use, with *Slow Cards for the Trade*,

**Lancet Hones**, No 1—4 inches

2—6 "

**Razor Hones** with 3—5 "

COLLINS'S

PATENT

DISINFECTING POWDER,

FOR THE

INSTANTANEOUS DESTRUCTION

OF

OFFENSIVE SMELLS,

AND FOR

PURIFYING THE AIR;

THEREBY PREVENTING

FEVERS, INFLUENZA, CHOLERA, AND INFECTIOUS  
DISEASES.

PATENTEE: R. N. COLLINS, WHOLESALE DRUGGIST,  
OXFORD COURT, CANNON STREET, LONDON.

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229, Strand, Near Temple Bar.

from a light Mahogany to dark Rosewood, according  
to the number of coats applied; it will stand both  
time and weather, it does not blister or peel off,  
it assists nature but does not efface it.

An Artist would be pleased to see the effect  
produced, whilst Varnishing or Polishing; the  
beautiful veins and feathery appearance of many of  
our common Woods being displayed as if by Magic.

Sold in Bottles, 1s. each, or 2s. per Pint.

PRINTED AT FROST'S ALBION PRESS, BRIDPORT.

THOMAS KEATING.



## Arkansas Oilstone,

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones**

## Circular Wheels

### Slips and Pencils.

Square, Oblique, Pointed, Round, &c. for  
Gauges, Parting Tools, &c.

THE BEST STIMULATING HONEY FOR RAZORERS AND  
Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones**, No 1—1 inches

2—6 "

**Razor Hones** with 3—8 "

CHLORINE is the most perfect "*de-odorizer*"\* and effectual "*dis-infectant*"† which science has brought to light; but the great difficulty has been to find economical and safe means for its production, and for its appliance to sanitary purposes.

COLLINS'S PATENT DISINFECTING POWDER now places within the reach of all, the means for producing "Chlorine" with the greatest certainty, facility, and safety. Formerly, chemical skill, expensive apparatus, and dangerously corrosive acids, were necessary for its production; but the discovery of this Powder enables *every person*, with *any open vessel*, and a *little moisture* (even a piece of damp paper), to make "Chlorine," either instantaneously or gradually, in large or in small quantities, as may be required.

This new chemical preparation has the power of instantly destroying offensive smells, and of purifying the air in all situations. It is superior to "chloride of lime," and to all "liquid deodorizers." By its use the possibility of BAD SMELLS in "nurseries" may be altogether prevented, the UNWHOLE-SOME AIR in "sick-chambers" immediately purified, and the foulest "water-closets" rendered scentless in a few moments. Wherever INFECTION exists, this compound is invaluable. By its use the progress of typhus and other malignant fevers has been retarded, the causes which give fatality to cholera have been modified, and thus the propagation of

\* Destroyer of Smells. † Destroyer of Infection.

*An article of Daily Utility.*

devastating or contagious diseases has been greatly diminished. The following account from "Sketches of Cholera," by the Rev. J. B. Owen, M.A. exhibits the effects of the Powder, under circumstances well calculated to test its efficacy.

"The case of James B—, a man for whom I had a great regard, was a painful illustration. His wife entreated me to come and see him. They informed me that he had obstinately refused all medicine and food, and had 'settled down to die.' I went to his house at ten o'clock at night: I found him, who in health and actual years was a young man of thirty; shrivelled, corpsed, and shattered by six hours' cholera into a torpid skeleton of seventy years. His flesh hung about him bagged and clammy,—his eyes were coated over with a thick transparent horn, as if already glazed for the 'dark lantern of the tomb,'—his long shaggy hair was pressed and beaten down in multiform patches all over his head—vestiges of the agony through which he had recently passed. The mouth of the sufferer, partly open, was another symbol of the suffering that left it so,—the teeth parted their rows in silence. Death had so visibly marked the victim, that it almost seemed a sacrilege to arrest the sacrifice.

"As I entered the wretched garret, its close and fetid atmosphere nearly overpowered me. I immediately scattered about it a few grains of Collins's Disinfecting Powder (unquestionably the cheapest, most portable, and even agreeable deodorizing substance I have yet met with) and instantly every smell had vanished, as if by magic—their presence being absorbed in the pleasant perfume of the Disinfectant. With great difficulty the poor man was roused to the recognition of his old minister: I asked him if he smelt something agreeable in his room? He faintly, and with some sensation of relief, at length said 'Yes.'

"I told him I had expelled the bad smell which had troubled him, and that he would have that nice smell all the night.

"The man, after a time, appeared to be surprised at the

*Invaluable for Nurseries.*

on a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

An Artist would be pleased to see the effect produced, whilst Varnishing or Polishing; the beautiful veins and feathery appearance of many of our common Woods being displayed as if by Magic.

**Sold in Bottles, 1s. each, or 2s. per Pint.**

PRINTED AT FROST'S ALBION PRESS, BRIDPORT.

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229, Strand, Near Temple Bar.

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## Arkansas Oilstone,

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

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## Circular Wheels

### Slips and Pencils.

Square, Oblique, Pointed, Roundel, for  
Gauges, Parting Tools, &c.

Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones**, No 1—4 inches

2—6 "

**Razor Hones** with 3—8 "

"difference in the air of the room, and even in his own sensations, which so simple an expedient had produced. At my imperative entreaty he swallowed some brandy, which I had slightly disguised with camphor. I insisted he should give me a smile when I shook hands with him for the night; and, in short, I quaintly insisted he was already better. I sent a nurse to carry out my directions. Hope revived in the man's heart; in the morning he was still alive; and within a week he was at his work again."

COLLINS'S DISINFECTING POWDER is an article of *daily* utility, and ought to be found in every dwelling. It is invaluable for Nurseries, and Sick-rooms. Also for keeping Stores and Larders perfectly sweet, for making "BLEACHING LIQUID," and for various household and other purposes.

COLLINS'S POWDER does not contain any metallic or poisonous substance; and may be safely used by the most inexperienced person. Offensive smells arising from Cesspools, Drains, &c. are immediately destroyed by throwing in a little of the Powder; and a room contaminated with infection or bad smells, is quickly purified by placing in it an uncorked bottle of the Powder, or by exposing a small quantity in any open vessel, such as a jar, a tumbler, or a plate. In the one case, the *dampness* rapidly extricates the purifying powers of the Powder, and the offensive smells are instantly destroyed; and in the other, the *moisture of the atmosphere* occasions a gradual and continuous liberation of Chlorine, which mingles with and purifies the contaminated air. When the odour of the Powder becomes

*Useful in every Dwelling.*

perceptible in the place where it is used, the infection and bad smells are destroyed.

The value of this discovery to principals of large public and private establishments, but especially to families, is attested by numerous testimonials from eminent Physicians, Surgeons, Chemists, Ship-owners, Manufacturers, and others. Brief extracts from a few of these testimonials are subjoined.

"COLLINS'S DISINFECTING POWDER is so compounded as to give off free chlorine gas upon exposure to moisture; thus it becomes a DEODORANT of all noisome smells arising from putrid animal or vegetable matter, and a DISINFECTANT from Cholera. I have witnessed several experiments, and find that from a quarter to half an ounce completely and instantly destroys the most disgusting stench. The public will thus be enabled to judge of its efficacy in destroying nuisances, and preventing infection in a sick-room. Its use for disinfecting purposes is attended with the greatest facility and convenience.

W. HERAPATH, Philosophical Chemist."

"I have been requested to examine and report upon the properties of COLLINS'S PATENT DISINFECTING POWDER; and to enable me to express my opinion fully and confidently, I have attended the performance of a number of trials of this powder as a Disinfecting Agent.

"As a means of furnishing a supply of Chlorine, for sanitary purposes, COLLINS'S POWDER presents great advantages over 'chloride of lime,' from which it is impracticable, under ordinary circumstances, to obtain a *gradual* and *continuous* supply of this gas. Its action as a deodorizer being effected by its gaseous element, it is much to be preferred to the 'liquid deodorants,' which require to be intimately mixed with the offensive matter to produce the desired effect.

"The trials I have witnessed with COLLINS'S DISINFECTING POWDER, consisted in the deodorization of most offensive privies

*Indispensable in Sick-rooms.*

From a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

An Artist would be pleased to see the effect produced, whilst Varnishing or Polishing; the beautiful veins and feathery appearance of many of our common Woods being displayed as if by Magic.

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**Lancet Hones**, No 1—4 inches

2—6 "

3—8 "

**Razor Hones** with

—of collections of organic matter, undergoing decomposition in ash-pits—of accumulations of garbage and of blood, in an advanced stage of decomposition, in slaughter-houses. *In all these cases the result of the application of this Powder was highly satisfactory.*

R. H. BRETT, Ph.D. F.L.S.

Lecturer on Chemistry and Medical Jurisprudence at the Liverpool Infirmary."

"Having tried the effect of THE DISINFECTING POWDER in several instances, both in the case of decomposing animal substances, and of offensive smells in sick and ill-ventilated rooms, and those arising from drains, &c. I can speak most highly of its efficiency. In one instance, I particularly remarked that the peculiarly offensive odour from a case of cancer, which the 'chloride of lime' failed to correct, was entirely destroyed by merely removing the cork from a bottle of the Powder placed in the apartment. Now that so much attention is directed to noxious and offensive gases—being the fertile cause of illness—it is almost unnecessary to add, that no house or establishment should be without it.

DE BERDT HOVEL, Surgeon."

"I have extensively tried THE DISINFECTING POWDER, and bear testimony to its efficiency in the removal of unpleasant odours, such as are found in fever and cholera wards. I have also experienced the good effects arising from its use, in privies and stinking drains; and am of opinion that a knowledge of its powers cannot be too generally disseminated.

"It is so portable a powder, and the directions for its use so simple, and its price so cheap, that I would recommend its use in places in which large numbers of human beings are congregated; and in the houses of the poor generally.

JAMES CLARK, Surgeon."

"Having been applied to for our opinion of Mr. COLLINS'S DISINFECTING POWDER, which we have for some time past been employing in the Droitwich Lunatic Asylum, we have no hesitation in stating, that we have found it the most *effectual* deodorizing agent we have ever made use of; and that we consider

*Valuable in Kitchens and Laundries.*

It is a most important discovery for producing a *continuous exhalation of chlorine gas*, by which offensive exhalations are quickly removed.

MARTIN RICKETTS, F.R.C.S.E.  
CHARLES HASTINGS, M.D."

"We, the undersigned Officers of the Bromsgrove Union, have witnessed the benefits of COLLINS'S DISINFECTING POWDER, and are satisfied it is the most powerful agent we have met with, for the speedy and effectual removal of effluvia arising from privies, drains, dead animal matter, &c., and for purifying infected and unhealthy houses.

T. S. FLETCHER, M.R.C.S.  
JOS. HORTON, M.R.C.S.  
JOHN TOWNSEND, } Relieving Officers.  
WILLIAM WYATT, }  
SAMUEL CLARKE, Governor."

"As the principal 'liquid deodorants,' though highly poisonous, present the appearance of clear water, their use in the nursery and sick-room is not free from danger; the form of a dry powder has, therefore, many advantages, especially when the compound evolves its purifying properties either *instantaneously*, or *gradually and continuously*, as may be required.

"The great merit of Mr. COLLINS'S chemical discovery (its extreme cheapness alone excepted) consists in the facility, certainty, and safety with which even the most inexperienced person is enabled to employ the deodorizing and disinfecting powers of Chlorine for domestic and sanitary purposes.

HEATHFIELD & BURGESS,  
Manufacturing and Analytical Chemists."

"COLLINS'S POWDER contains no poisonous or metallic salt; it is more valuable than any deodorizer known, both for domestic and general purposes; and *will enhance the quality of MANURES* with which it has been mixed.

J. H. S. WILDSMITH, Analytical Chemist,  
Lecturer to Hoddesdon Agricultural College."

"By the kindness of the Rev. J. Hensman, our respected vicar, I had been provided with funds to purchase a quantity of 'COLLINS'S DISINFECTING POWDER,' for distribution amongst

*Useful in Larders and Provision Stores.*

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229, Strand, Near Temple Bar.

from a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both fire and weather, it does not blister or peel off, it assists nature but does not efface it.

An Artist would be pleased to see the effect produced, whilst Varnishing or Polishing; the beautiful veins and feathery appearance of many of our common Woods being displayed as if by Magic.

**Sold in Bottles, 1s. each, or 2s. per Pint.**

PRINTED AT FROST'S ALBION PRESS, BRIDPORT.

THOMAS KEATING.



## Arkansas Oilstone,

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones**

## Circular Wheels

### Slips and Pencils.

Square, Oblique, Pointed, Rounded, for  
Square, Gouges, Parting Tools, &c.

the most valuable Stone for Lancet and  
use, with *Show Cards for the Trade*.

**Lancet Hones**, No 1—4 inches

2—6 "

3—8 "

" **Razor Hones** with 3—8 "

the poorer inhabitants; and I present a statement of the manner in which I executed my self-imposed task, and of the results which I consider to have been thereby produced.

"Having first satisfied myself of the perfect efficacy of this Compound for destroying noxious smells, I devoted an entire week to visiting all the courts, alleys, and other confined places of this extensive parish; and I showed the poor inhabitants the manner in which the above-named Compound should be applied to their privies, and other receptacles of offensive matters; and I informed them that, on application to me, they would receive a gratuitous supply of the Disinfecting material. This intimation has been extensively acted upon, and the expressions of grateful acknowledgment from the poor people for the benefits they have derived, have been a sufficient repayment to me for my exertions.

"I may be in error, but I consider that the adoption of these measures has been the means, under Providence, of averting the visitation of Cholera from our favoured locality, when its ravages have been so severely felt in our immediate vicinity. W. J. HALL, Overseer of the Parish of Clifton."

*The example of W. J. Hall, Esq. is strongly commended to the Clergy, to District and Christian Instruction Visitors, to Sunday School Teachers and others, who periodically visit the abodes of the sick and the poor.*

"I beg leave to state the particulars of the use of THE DISINFECTING POWDER in destroying offensive smell, proceeding from a corpse, which came under my notice:—A workman, occupying one of my houses, having died, his body became so offensive the second day after his death, as to cause the most serious inconvenience to his family and their neighbours, when his widow was furnished with about two ounces of the Powder, which, being placed in the coffin, so completely destroyed the effluvia, that not the slightest smell was perceptible; and this freedom from all inconvenience was equally perfect when the interment took place. WILLIAM HUNT."

Sold by Druggists and Oilmen,

Price 6d. 1/- 1/6 & 3/-

[In sending forth these detailed directions, the writer feels it a duty to state that this "Chemical Compound" is quite distinct from a *secret* or "proprietary medicine"—its composition being well known to medical practitioners and chemists, through the medium of the scientific periodicals. The truth of the statements as to its "dis-infecting" and "de-odorizing" powers—as to the absence of all metallic or poisonous substances in its composition—and as to its value in fixing the "Ammonia" and other volatile products in "*Mauures*," can therefore be easily tested.]

## DIRECTIONS FOR HOUSEHOLD USE.

The application of COLLINS'S POWDER is of the simplest character. — Its effects are solely regulated by the quantity exposed, and by the "degree of moisture" applied to it. If sprinkled upon any *WET* surface, its purifying power is *rapidly* set free; but if merely exposed to the *MOISTURE* of the atmosphere, the liberation of this power is both *gradual* and *continuous*.

## FOR NURSERIES, SICK-ROOMS, &amp;c.

**BAD SMELLS OR INFECTION.**—When a place becomes contaminated with bad smells or infection, it is quickly purified by placing in it an uncorked bottle of the Powder, or by exposing a table-spoonful in any open vessel, such as a jar, a tumbler, or a plate.\* If the smells be not immediately removed, add a FEW DROPS of water to the Powder exposed in the jar or plate; but generally the *moisture of the atmosphere* will suffice. When the odour of the Powder pervades the apartment where it is used so as to become perceptible, the infection and bad

\* "Spoons" have been named in these Directions as well-known measures; but the least experience will enable any one to guess the requisite quantities with sufficient exactness.

*A Shilling Package sufficient for Three Months' Domestic Use.*

from a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

An Artist would be pleased to see the effect produced, whilst Varnishing or Polishing; the beautiful veins and feathery appearance of many of our common Woods being displayed as if by Magic.

**Sold in Bottles, 1s. each, or 2s. per Pint.**

PRINTED AT FROST'S ALBION PRESS, BRIDPORT.

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229, Strand, Near Temple Bar.

THOMAS KEATING.



**Arkansas Oilstone,**  
(For Gravers, &c.)  
Immensely hard, pure and fine cutting.  
**In Hones**

**Circular Wheels**  
**Slips and Pencils.**  
Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

**Lancet Hones,** No 1—4 inches  
2—6 "  
" "  
**Razor Hones** with 3—5 "

smells are destroyed; the Powder may than be covered over or removed.\*

This method of using the "Compound" is suitable for all places where bad smells arise (the sources of which cannot be reached by throwing in the Powder), or where persons are congregated without sufficient ventilation; as in Hospitals, Infirmarys, Workhouses, Prisons, Courts of Justice, School-rooms, Workshops, Crowded Assemblies, Provision-warehouses, and Public Markets—and especially during hot weather and in times of sickness.

It is equally applicable for purifying the air in Water-closets, Urinals, Stables, Cattle-sheds, Piggeries, Fowl-houses, Dog-kennels, Menageries, &c.

Persons visiting the sick will find a small vial (such as a smelling bottle) filled with the Powder, amply sufficient to remove the inconvenience and danger often experienced during visits. [See page 3 for an interesting example.]

PREVIOUSLY to the use of a night-pan, or chamber-utensil, throw into it a tea-spoonful of the Powder, and it will effectually prevent any disagreeable odour.

In Nurseries, Sick-rooms, and imperfectly ventilated rooms, this use of the "Compound" is most convenient; a very small quantity being all that is required. If an offensive smell be perceptible, sufficient powder has been used—if the odour of the powder strongly predominates, it proves that too much has been employed.

FOR WATER-CLOSETS, CESSPOOLS, DRAINS, &c.

OFFENSIVE SMELLS arising from such receptacles are immediately destroyed by throwing in

\* Should the smell of Chlorine in any case prove unpleasant to an invalid, put half-a-pint of water to a tea-spoonful of the Powder, and expose some of the Solution in a basin; or dip a strip of linen into the clear Liquid, and use it in the sick-chamber. This gives a cheap and easy method of making a strong and uniform "Solution of Chlorine" which may be used whenever the liquid form is preferred.

*Easy of Application.*

small quantity of the Powder. If this be DAILY repeated, the generation and escape of pestilential or offensive effluvia will be prevented, and the quality of the *manure* greatly improved.

This mode of using the "Compound" is also particularly adapted for Dust and Dung-heaps, Sewers, Manure-tanks, Stagnant Ditches, Bilge-water, &c. Likewise for the refuse unavoidably collected upon the premises of Butchers, Fishmongers, Poulterers, Tallow-melters, Slaughterers, Bone-boilers, Glue-makers, &c.

The Testimonials on pages 5 to 8 will show that the salutary effects of this new chemical compound have been fully proved. Many similar attestations of its powers have likewise been received; as also numerous private letters from ladies, in which they declare that its value for domestic purposes is such, that they "would not, on any account, be without it."

FOR KITCHENS, SMOKING-ROOMS, &c.

COLLINS'S POWDER does not contain any metallic or poisonous substance; nor is its application confined to the destroying of infection and offensive smells. It is useful in Kitchens, Taverns, and Smoking-rooms, as it prevents *Taint* and destroys any unpleasant smells arising from Cooking, Cabbage-water, Tobacco-smoke, &c.

PREVENTION OF TAINT IN STORES, LARDERS, &c.—By placing a little in Stores and Larders where Meat, Poultry, Fish, &c. are kept, the spread of *taint* will be materially checked, Game, Meat, &c. may also be preserved during *transit*, by placing in the package which contains it some of the Powder, enclosed in pieces of dry linen rag.

The Powder will likewise remove any smell which Game, &c. acquires by keeping—thus: after trussing, hang the birds, &c. for a short time in any open vessel (such as a pun or large jar) into which put a little of the Powder in a wet rag or a piece of wet paper. Though the odour of the Powder will not injure the flavour, the Game should be removed from

*Its Effects are Instantaneous.*

from a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

An Artist would be pleased to see the effect produced, whilst Varnishing or Polishing; the beautiful veins and feathery appearance of many of our common Woods being displayed as if by Magic.

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Immensely hard, pure and fine cutting.

In **Hones**

## Circular Wheels

### Slips and Pencils.

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones**, No 1—4 inches

**Razor Hones** with 2-6 " 3-8 "

## 12 COLLINS'S DISINFECTING POWDER.

the pan or jar when the purification is completed. All smell of the chlorine is dissipated during the cooking.

**PREVENTION OF SMELL FROM "GREEN WATER."**—If a tablespoonful of the Powder be thrown into a pan, and the water in which "*Green Vegetables*" have been boiled be then poured upon it, the disagreeable smell which otherwise would proceed from the water will be prevented, as the cause of it will be destroyed.

The unpleasant odour which arises in a room after smoking is prevented by placing in it an uncorked bottle containing some of the Powder.\*

**MUSTY CASKS, STONE BOTTLES, &c.** may be deprived of smell by throwing into them a little of the Powder, letting it remain for a time, and then well soaking and rinsing with clean water.

### FOR LAUNDRIES, WASH-HOUSES, &c.

The Disinfecting Powder is also applicable for **BLEACHING**, for purifying **INFECTED CLOTHING**, and for all purposes for which "*Solutions of Chloride of Lime*," and "*Chloride of Soda*," are used.

**BLEACHING LINEN, REMOVAL OF STAINS, &c.**—Two table-spoonfuls put into a bottle, adding half a pint of water makes a strong "**BLEACHING LIQUID**," which takes out the stains of fruits, port-wine, and mildew, from linen, cottons, muslins, lace, and leather. A single stain may be conveniently taken out by wetting it with water, and placing upon it a little of the Powder. For Bleaching Linen, articles of dress which have acquired a yellow colour from long-continued use—pour a quart of water upon a table-spoonful of the Powder, and soak the linen, &c. in the clear liquid, for one or two hours. As soon as the stains are removed, or the bleaching is completed, the articles should be well rinsed in clean water.

**INFECTED CLOTHING.**—Linen Garments which have been worn by persons infected with fever, &c. should be soaked

\* Chlorine has a tendency to rust iron, the Powder should not, therefore, be "exposed" near to bright steel furniture, and when not in use, the bottle or jar containing it should be kept well corked.

*Economical and Effective.*

and well rinsed, as directed for bleaching linen; and the Woollen Garments should be shut up for a short time in a box or trunk, with some of the Powder wrapped in a wet rag, and afterwards exposed in the open air.

\*. Although "CHLORINE" quickly and effectually discharges all stains produced by vegetable substances, it does not remove mineral stains, such as Ink, iron-mould, &c. These stains may, however, be completely taken out either from linen, printed books, or plain paper, by first applying Oxalic Acid, or Tartaric Acid, or Salt of Lemons; and then using some "BLEACHING LIQUID" to abstract the yellow colour which the stain will then assume:—Thus, after applying either of the above-named preparations to the stain, and well rinsing the linen, &c. with water; soak the stained part for a few minutes in the "BLEACHING LIQUID," see the preceding page, and every vestige of stain will be removed.

"Salt of Lemons" is easily made, by well mixing 2 parts Salt of Sorrel with 1 part Cream of Tartar; and scenting the mixture with a little Essence of Lemons. Strong vinegar or the juice of a lemon will remove the black stain of ink, &c; but neither is so economical as Tartaric Acid, which, although dearer than Oxalic Acid, is safer for domestic use.

#### FOR THE EXTIRPATION OF VERMIN.

Most satisfactory results have been produced by the use of the "Compound" for this purpose; especially in dwellings, shops, and warehouses, infested with rats.

The mode of application is very simple. Enclose some of the Powder in a piece of rag, and thrust it into the haunts of Rats, Mice, Cockroaches, &c.

#### FOR USE IN VAULTS, MAUSOLEUMS, &c.

The possibility of bad smell and the danger of infection are prevented, by placing an uncorked bottle of the Powder in Coffins—in the Places where the dead are deposited previously to interment—and in Mausoleums, &c. [See page 7.]

*Applicable for Manifold Purposes.*

from a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

An Artist would be pleased to see the effect produced, whilst Varnishing or Polishing; the beautiful veins and feathery appearance of many of our common Woods being displayed as if by Magic.

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# Arkansas Oilstone,

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Immensely hard, pure and fine cutting-

In **Hones**

# Circular Wheels

## Slips and Pencils.

Square, Oblique, Pointed, Rounded, for  
Square, Gouges, Parting Tools, &c.

Lancets, and admirably adapted for private  
use, with *Show Cards for the Trade.*

**Lancet Hones,** No 1—4 inches

2—6 "

**Razor Hones** with 3—5 "

## DIRECTIONS FOR SHIP USE.

The Disinfecting Compound will add comforts to "the home of the sailor." and to the temporary homes of emigrants, troops, &c. while crossing the ocean, and especially if there be children on board.

**FOR DESTROYING THE SMELL OF BILGE-WATER.**—Draw the sucker and box of one of the pumps, put in about a pint of the Powder, wash it down into the bilge with a few pails of water, then pump out with the other pump. Use more or less of the Powder, according to the quantity and offensiveness of the bilge-water—using sufficient to destroy the smell.

**FOR PURIFYING THE AIR IN CABINS, WATER-CLOSETS, &c.**—Place two or three table-spoonfuls in a jar, tumbler, or plate, as directed for sick-rooms, &c.

**FOR LOADING OR DISCHARGING OFFENSIVE CARGOES.**—Put a few pounds of the Powder upon the timbers and beams of the vessel, and all disagreeable smells will be destroyed as they arise. The Powder used, should be increased or diminished according to the nature of the cargo.

**FOR CLEANSING SHIPS WHEN DISCHARGED.**—After clearing out the hold, place the Powder upon the beams and timbers—close the hatches, and the ship will soon be purified. Even vessels which have been loaded with Guano may thus be rendered free from smell.



Although an ordinary bottle, a wine glass, or a plate, and a little moisture (even a piece of damp paper) is all that is required to develop the extraordinary effects of the Disinfecting Powder; yet the desire to have an ornamental bottle has induced the writer to design a suitable Jar, fitted with a regulating stopper, and which may be obtained through any Druggist or by application to the Patentee.

R. N. COLLINS, Oxford Court, Cannon St. London.

Extract from "HOW TO MAKE HOME HEALTHY."

"We are spared the infliction of beholding the pestilential effluvia issuing from the abodes of wretchedness and filth, as well as the fearful exhalations which escape from putrefying animal and vegetable matter; but we are not left to suffer from their effects unwarned, for the *offensive smell* gives *warning* of danger, and should stimulate to duty. These "gases" are POISONOUS, moreover, to punish us if we neglect chemically to unite them with other substances, thus changing their nature and depriving them of all baneful qualities."

"It is not enough that we selfishly rid ourselves of the evil, and send the pestilential effluvia abroad to contaminate the pure air given to mankind in common—we can turn the *poisonous* exhalations into harmless compounds—we can convert them into materials which are essential to the life of plants—the Creator having thus constituted the elements of which the world is made that nothing may be lost. IF RIGHTLY USED, "THE REFUSE ANIMAL AND VEGETABLE MATTER" WOULD RE-PRODUCE MORE FOOD, THAN ALL LIVING BEINGS COULD EAT. This astounding statement is founded on lengthened and careful reasonings, and it is justified by the researches and experiments of the most eminent chemists. What a view does this give us of creation! The more living beings there are, the greater comforts mankind may enjoy—the more leisure they may have to cultivate their minds—the greater freedom from mere slavish toil to obtain the necessities of life—the less danger from the desolating effects of famine and pestilence. All are

[See next page.]

from a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

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**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting-

In **Hones**

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

The best sharpening stone for Razors and  
Lancets, and admirably adapted for private  
use, with *Shave Cards for the Trade.*

**Lancet Hones,** No 1—1 inches

2—6 "

**Razor Hones** with 3—4 "

*Just Published, gilt edges, price 6d.,*

DEDICATED BY PERMISSION TO  
THE RIGHT HON. LORD ASHLEY, M.P.

## HOW TO MAKE HOME HEALTHY.

By the Author  
OF  
THE TEACHER'S COMPANION.

"Neglect and filth are linked to decay and  
disease, by a law as immutable as that which  
connects weeds with a deserted garden, or cor-  
ruption with a stagnant mind." Page 22

LONDON:  
HOULSTON AND STONEMAN,  
65, PATERNOSTER ROW,  
AND OTHER BOOKSELLERS.

# MAHOGANY STAIN,

EXHIBITED BY THE INVENTOR,

JOHN COPPOCK,  
CHEMIST, BRIDPORT,

Section 1, Class 2, No. 65, South Gallery.

A  
CHEMICAL LIQUID,

FOR IMPARTING A

Mahogany and Rosewood Colour to common  
Woods, such as Deal, Ash, Elm, Oak,  
Beech, Birch, Sycamore, &c.

Its simplicity of application makes it superior to others, no size of any kind being required.---The Stain is put on with a common brush, and when perfectly dry, Varnish or French Polish, which renders the wood equal in appearance to the best Veneers.---The same Stain produces various shades, from a light Mahogany to dark Rosewood, according to the number of coats applied; it will stand both time and weather, it does not blister or peel off, it assists nature but does not efface it.

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**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c.

The best instrument known for Lancets and  
use, with *Show Cards for the Trade*.

**Lancet Hones, No 1—4 inches**

2—6 "

2—6 "

2—6 "

**Razor Hones** with 3—4 "



I beg to inform you that I have just received a fresh supply of MATICÒ, and that I shall be happy to supply you with any quantity of it, and also with the Pamphlet of its use, by THOMAS JEFFREYS, M.D.

Waiting your favours,

I remain,

Your obedient servant,

THOMAS KEATING.



## MATICÒ, OR THE PERUVIAN STYPTIC.

This powerful vegetable Astringent was first made known to the Medical Profession of England, by Dr. JEFFREYS, of Liverpool, through the medium of *The Lancet*, so far back as January 5th, 1839.—See his *Letter in that Periodical Publication*. Since that period he has, after much trouble, inconvenience, and expense, used every means in his power to extend its use and confirm its efficacy; and can now, with confidence, recommend its notice to his Medical Brethren, as a valuable Styptic externally, and as a powerful Astringent internally. It will also be found a safe remedy in the hands of those not of the Faculty to suppress Bleeding from Wounds, Leech Bites (so often difficult to stop in delicate children), and from accidents, where profuse hæmorrhage may be either troublesome or dangerous; and has been successful where more severe and painful means have failed. Several hundred specimens were distributed to the Members of the Provincial Medical and Surgical Association, at their Anniversary Meeting, which was held at York, in the month of August, 1841; and a Paper on its history and power, was published in the Transactions of that Society (vol. xi.) which appeared in May, 1843.

During the last two years, (viz. 1844 and 1845) this medicine has been extensively prescribed by several of the most eminent of the Faculty in London; and its efficacy in Leucorrhœa and other female complaints, may now be considered as established.

As a powerful Styptic in gun-shot wounds, Maticò has long been known in South America, where it has acquired the name of the *Soldier's Herb*: and it may be mentioned, that a good deal has lately been shipped for the use of the Armies in India.

### MANNER OF USING IT EXTERNALLY.

To Leech Bites apply the *inner* side of the leaf, keeping the finger pressed close upon it for a few minutes, until it adheres firmly to the part. The same mode is also suitable for Cuts, or recent Bruises; but if to a flat extended sore, the *Powder* may be sprinkled upon it, and lint, made wet with the Tincture, placed over it. In Bleeding from the Nose, the Powder, used as Snuff, has been found speedily efficacious.

### USE INTERNALLY.

It may be taken in Decoction or Infusion, made from one ounce to one ounce and a half, in severe cases, and given in doses of two or three table spoonfuls, according to the urgency of the symptoms; but in such cases it should not be taken without the direction and regulation of its exhibition by a medical man.

N.B.—As there is not only a spurious Herb sometimes offered for sale, but also an inferior sort met with in the market, the first of which is quite inert, and the latter inefficacious, the public are earnestly warned not to use any but that which is genuine, and which is now well known. It may be had from Mr. KEATING, Chemist and Druggist, 79, St. Paul's Church Yard, London.

The Third Edition of the Pamphlet, by Dr. JEFFREYS, with numerous cases of its efficacy, may be had of MR. KEATING, and of all Booksellers, Price 1s.

## OPINIONS OF THE PROFESSION.

Incolæ ad gonorrhœas et ulcera canerosa a lue venerea ortas, extirpandas decoctum affatim hauriunt.—*Flora Peruviana*.

"A lady of my acquaintance has taken up the subject very enthusiastically; and having cut her finger, applied the leaf of the Matico, and found that it was the underside of the leaf alone which possessed the styptic quality. I find on trial she is correct in her statement."—DR. HENDRICK, Warrington.

"I consider, from the comparatively limited scale of experiment, that it has proved decidedly efficacious as a remedy in the subjoined instances; so much so as to warrant my confidence in it, as a valuable addition to our stimulant and astringent class of remedies. I need not go into any particulars, but simply to give the nature and number of cases wherein on trial it has answered the expectations your account led me to form of its virtues:—

|                                                                                 | Cases. |
|---------------------------------------------------------------------------------|--------|
| "Blenorrhagia . . . . .                                                         | 5      |
| Vaginal Leucorrhœa . . . . .                                                    | 3      |
| Uterine ditto, (conjoined with a rubefacient liniment over the loins) . . . . . | 1      |
| Hæmaturia . . . . .                                                             | 1      |
| Hæmorrhage from the bowels . . . . .                                            | 2      |
| Cynanche Tonsillaris . . . . .                                                  | 2      |

And successful as a styptic in case of nævus, after removal by double ligature, where one or two small vessels proved troublesome on its coming away. I used it internally and externally, in general, according as the case admitted of it, in both instances confining myself to the one mode of exhibition by infusion."—DR. G. C. WATSON, Surgeon to the Liverpool Lying-in Hospital.

"From these cases" (of arrested hæmorrhage) "I cannot doubt that the Matico has most decided qualities, and that it may become a very valuable addition to our Materia Medica."—DR. MONRO, Surgeon to the Dundee Infirmary.

"The bite of a leech, which was applied to the chest, bled profusely, and resisted the usual means of stopping it; but by placing a piece of leaf on the bite, and keeping it fixed by the finger for a few seconds, the hæmorrhage totally subsided, much to my satisfaction and the astonishment of the child's friends."—DR. R. W. SCOTT.

"The following may be adduced among others, as cases in which the Matico was of the greatest service:—

|                                     | Cases. |
|-------------------------------------|--------|
| "Gonorrhœa . . . . .                | 3      |
| Leucorrhœa . . . . .                | 5      |
| Menorrhagia . . . . .               | 2      |
| Hæmorrhoids (very severe) . . . . . | 1      |
| Epistaxis . . . . .                 | 1      |
| Catarrhus vesicæ . . . . .          | 1      |

DR. DICKINSON, Liverpool.

"In confirmation of the good effects of the Matico in intestinal hæmorrhage, I may mention a severe case of sanguineous dysentery. There is a profuse discharge of pure blood, with scarcely any feculent matter in the stools. I immediately prescribed a decoction of the Matico, in the proportion of half an ounce to the pint, and directed three table spoonfuls every four or six hours, three doses of which completely suppressed the hæmorrhage.

"I may also mention that the daughter of the last patient was attacked with laryngitis, for which ten leeches were applied with great relief; but the oozing of blood from some of them could not be staid: I immediately applied compresses made wet with the decoction ordered for her father, and the good effects were almost immediate."—DR. JEFFREYS.

"I must express my earnest praise in favor of Matico, having tried it in about ten cases with complete success. It has often succeeded after all other styptics had failed."—SAMUEL WOOD, Esq., House Surgeon, Salop Infirmary.

"Dr. Sommé, of Antwerp, has used it in several cases of hæmorrhage and gonorrhœa, with advantage."



THE BEST RUNNING STONE FOR LANCET AND  
 Lancelts, and admirably adapted for private  
 use, with *Show Cards for the Trade*,  
**Lancet Hones**, No 1—4 inches  
 2—6 ”  
**Razor Hones** with 3—5 ”

**Circular Wheels**  
**Slips and Pencils.**  
 Square, Oblique, Pointed, Rounded, for  
 Gouges, Parting Tools, &c.

**Arkansas Oilstone,**  
 (For Gravers, &c.)  
 Immensely hard, pure and fine cutting.  
 In **Hones**

“I never saw any remedy act so beneficially; and I must think it a most useful addition to our Pharmacopœia. I believe that Matico will be handed down the stream of time, and hailed in ages to come as a blessing to Society.”—W. H. BAINBRIDGE, Esq., Surgeon to the Northern Hospital.

“The Matico, or Matic, so highly esteemed in Peru, Dr. Martin believes to be a species of *Phlomis*. The tree grows in the interior of Peru; also on the other side of the Andes.”

“Its leaves are said to possess marvellous medicinal properties. The preparation for use among the Indians is very simple; the leaf is dried and finely powdered, and the dust, sprinkled on wounds, is said to effect cicatrization very speedily. The Indians use an infusion of the fresh leaves as an aphrodisiac, and also attribute to them the power of arresting hæmorrhage, even if a large vessel be wounded.”—*The Medical Times*.

“The Matico has been tried here in cases of leech bites, with admirable success; and so far I can add my own knowledge of its superior efficacy in arresting hæmorrhage, I have succeeded immediately with it: and in one case where the usual applications had entirely failed.”—PROFESSOR PAYNE, New York.

“From the little experience I have had of the effects of the Matico, I consider it a valuable medicine, and shall try it more largely, particularly in extreme hæmorrhage.”—THOS. HAFFENDEN, Esq., Surgeon, Hanwell.

“These cases, of themselves, would, I confess, not satisfy me of the styptic properties of the Matico; but with the published analytical evidence, and that derived from the experience of other members of the profession, who have made trial of it, they give me great confidence in its alleged powers, and lead me to expect that ere long it will be regarded as one of the most valuable of our medicinal agents.”—MR. GAY, Surgeon, London.

“I have great pleasure in bearing testimony to the efficacy of the Matico in arresting hæmorrhage, as my partner Mr. Blake has used it six times, in a case of cancerous ulceration of the womb, during the recurrence of the bleedings, and each time it has completely stopped the hæmorrhage.”—BENJAMIN VALANCE, Esq., Surgeon Brighton.

Among a number of other Gentlemen who have given their testimony to the importance of this medical agent, are—Dr. Hunter Lane; Mr. Eccles; Dr. Kingdon; Mr. Oswald; Dr. Davies (Warrington); Mr. John Marshall; Mr. Neill (Liverpool); Dr. W. H. Cullen; Mr. J. A. Edwards; Mr. H. C. Attenburrew; Mr. Johnstone (Liverpool); Mr. Long (Liverpool).

Since the first introduction of this remedy, other features of its effects are worthy of remark, and none more so than its successful exhibition in the more obstinate forms of Diarrhœa, and those Epidemical derangements of the Bowels, indicating Cholera.

# LAMPLOUGH'S EFFERVESCING PYRETIC SALINE.

This portable, delightful, and invigorating preparation, when simply mixed with water, contributes more to the refreshment of the body than any known beverage. It supplies the system in the most agreeable form with the salines that are exhausted by continuous exertion, protracted care, watching, or intense heat. It alleviates thirst in a most remarkable manner, replenishes to nature the loss she sustains from exciting causes, and furnishes the system with the salts found in the blood when in a healthy state, which the Pyretic Saline chemically resembles in a most remarkable degree.

Dr. Stevens asserts that, where the Saline treatment has been adopted, the fatal West India fevers have been disarmed of their terrors. (See his new Work.) Dr. O'Shaughnessy says that the Clinical statement of Dr. Stevens has rivetted the attention of all scientific physiologists and practitioners of Europe and America.

Dr. Prout has characterised the discovery of it, as apparently unfolding the germs of immense benefit to mankind, certainly of importance equalled only in the annals of medicine by those of the illustrious Harvey and Jenner.

To the intelligent but uninitiated in the art and mystery of medicine, it is merely necessary to recall the fact, that at one period all parts of the body were in a fluid state, and daily and momentarily since, have derived their nourishment and support from the vital current—the necessity of keeping that fluid supplied with the stimulus which is the true cause of its action is most important, and must be apparent to all.

Dr. Yeoman, speaking of the Pyretic Saline, in the *People's Medical Journal*, 29th April, 1851, says, "For a cooling, refreshing, and wholesome spring or summer beverage, we know of nothing better than a tumbler of fresh water and a teaspoonful of this preparation. We speak from proved and personal experience, and cordially recommend our readers to test it in like manner."

Those who from choice, drink water, or from necessity take that which has filtered through chalk, should use frequently the Pyretic Saline, to prevent the injurious consequences arising from its being surcharged with that substance. It has been proved, beyond all doubt, that these Salines are the means Nature uses to hold in solution the lime necessary to the formation of bone in the body, hence, a deficiency will account for gout, gall stones, and other painful affections.

In connexion with these facts, it is necessary to associate the name of LAMPLOUGH, Chymist, 88, Snow Hill, London, whose reiterated attempts during past years have been eminently successful in manufacturing the Pyretic Salines in an agreeable, cheap, and efficacious form, suited to all constitutions; for, like natural food, they assimilate with it, and are taken up by the absorbent vessels, diffusing themselves again through the system, thus supplying the continuous waste of natural secretions, however great or varied they may prove.

Prepared only at the Laboratory,  
88, SNOW HILL, & 1, NEW FARRINGTON STREET,  
LONDON.—Established 1707.

first my square

Vernis de Couleura  
Rue Montmartre, 16,  
à Paris.  
Monsieur à la Chapelle St. Jean

Nouveaux Vins

et je les recommande à

justifier

L'abbé

St. M.

en 2. 7. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



**Arkansas Oilstone,**

(For Gravers, &c.)

Immensely hard, pure and fine cutting.

In **Hones** .....

**Circular Wheels**

**Slips and Pencils.**

Square, Oblique, Pointed, Rounded, for  
Gonges, Parting Tools, &c.

the best material, and admirably adapted for private  
use, with *Show Cards for the Trade*.

**Lancet Hones**, No 1—4 inches

2—6 "

"

**Razor Hones** with 3—8 "

LYELL'S PATENT

REGISTERED

Vernis de Couleur  
Deux, Montmartre, 169,  
à Paris.  
Allure à la Chapelle St Denis.

Mention honorable  
à l'Exposition  
de 1849.

Admis à l'Exposition de Londres.

Maße 12

Nouveaux Vernis en Couleur pour-Papiers de Métalux  
Vernis de Versie pour-Tablette en Décora

J'ai l'honneur d'appeler l'attention publique sur les avantages  
incontestables que présentent mes Vers. Leur Simplicité et leur Brillant  
l'enseignement de leur supériorité et en rendent l'usage incontestablement facile.  
Le monument de la Grèce se trouve simplifié, l'on ne remarque aucune  
épaisseur sur les objets vains. Le Vers est maître pour l'Enchaînement, morale  
surtout d'être signifié pour sa parfaite clarté et sa propriété. Son  
constance de mesure à toutes les couleurs et même au blanc lui prête  
leur fraîcheurs primitives. Le Vers offre encore un avantage que l'on  
n'a eût pas obtenu jusqu'à ce jour celui de laisser à la Grèce tout sa simplicité.

J'ai assuré que tous les produits de ma Maison sont indispensables  
et je le prouve à tous les Consommateurs dont la confiance me témoigne  
justifia

S'adresser à Londres pour les envois  
M. W. Barrett Gordy. Strand W.  
Five my square







Vernice e Colori.  
Contrada Monasterio 169.

Fabrica

alla Capella Santo Dionigio.

B. Lefèvre.  
in Parigi.

Menzione onorevole  
all' esposizione generale  
di 1849.  
Annuncio all' esposizione  
di Londra.

Nuova Vernice di Colore per barche e Metalli  
Verde di Vessica per tavolette e decoro.

Ho l'onore di richiamare l'attenzione pubblica sopra gli incontestabili vantaggi  
che presentano le mie Vernici. Il tempo ad il loro bello trasformato la loro superiorità  
e ne rendono l'impiego molto facile. L'addeperare della spazzola facilita il lavoro  
e non lascia alcune tracce di spazzola sull'oggetto invernistrato.

La vernice sopra colore che si impiega per quadri merita fra tutti di essere  
rimunerata per la sua perfetta bianchezza e la sua qualità ben definita di conservare a  
tutti i distinti colori anche al fuoco il suo candore e primitiva freschezza.

Questa Vernice presenta inoltre un vantaggio non ottenuto fin a questo giorno  
quello di conservare alla tela la sua morbidezza naturale.

Posso assicurare che tutti i prodotti della casa mia sono perfetti e gli sono  
molto utilissimi ai consumatori promettendogli di giustificare la confidenza che  
degnarono accordarmi.

Indirizzarsi a Londra per renseignements al Signore Barbell,  
George Street, 20.



Lacke und Farben  
 Strauß, Montmartre, 109  
 in Paris  
 Druck in der Druckstadt  
 " Chapelle St-Omer.

# Dr. Defeuille.

Ehrenvolle Empfehlung  
 . Hogenhausen, Ausstellung  
 Paris 1849.  
 Exposition des Beaux-Arts  
 Ausstellung 1851.

Neue Farbenlacke anwendbar auf Papier und Metalle  
 Glasengrün für und zu Verzierungen Cabletten.

Der Unterzeichnete erlaubt sich die öffentliche Aufmerksamkeit auf die  
 unerschöpflichen Vorteile seiner Lacke in Bezug auf die Haltbarkeit  
 und die Glanz zeigen zu wollen. Die Vorteile und Vorzüge dieser Lacke  
 die Anwendung der Drucke und Verzierung und man konnte kaum noch  
 Stelle auf den besten Gegenständen  
 der farbige Lack für Gemälde verdient besonders deshalb anzuwenden  
 werden, weil er mit einer vollkommenen Weise die vorhandenen Gegenstände  
 verleiht die Schönheit und Farbe aller Farben selbst die welche zu erhalten  
 können. Auch wird ausserdem nicht ohne Vorteil der Nutzen sein,  
 dass man keinen anderen anrichten kann: die Anwendung dieser Lacke  
 ist sehr leicht und man kann sie in jeder Lage anwenden.

Alle Gegenstände, welche diese Lacke erhalten sind und die keinen Schaden  
 davon zu fürchten haben, werden  
 Dr. Defeuille.

Handlung erlaubt es Jedem  
 Dr. Defeuille, 109 Chapelle St-Omer.

Paris 1849. 109 Chapelle St-Omer.

# MASON'S

CELEBRATED

ROYAL PREMIER

## BLACKING,

*Is preferred by the Court & Nobility of England  
and by the first Boot makers in the Kingdom.*

The result of over twenty years' experience and study; possessing the most intense brilliancy with extreme permanence and the deepest jet black, combined with (by a peculiar and original process) an amount of oleaginous matter, by which the Leather is softened and preserved; thus blending to an unprecedented extent, the greatest possible means of nutrition with the highest attainable brightness

It has endured (for the last four years) the critical test of the first judges in the kingdom, by whom it is pronounced to stand alone for excellence and unapproached by any other.

*It is no higher in Price than the Common  
Blacking,*

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|---------------|------|------|------|---------------|
| 12s. per doz. | .... | .... | .... | 1s. 6d. size. |
| 8s.           | "    | "    | .... | 1s.           |
| 4s.           | "    | "    | .... | 6d.           |

MASON'S ENAMEL VARNISH for Dress Boots and Shoes,  
from 4s. to 36s. per doz

MASON'S WATERPROOF VARNISH for Hunting & Fishing  
Boots, Harness and Coach Heads, from 8s. to 36s. per  
doz., or £1 per gal. each stand pre-eminent.

No. 11, Munster Street, Regent's Park, London.

ORDERS (BY POST) HAVE PROMPT ATTENTION.

No. 22, Class II, Chemicals, South Gallery, in the  
GREAT EXHIBITION, see catalogue.

*Specimens, illustrating the advantages of the* **CRYSTAL  
PALACE, Chymical De**

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INGHAM.



The best running mode for Lancers' stock  
**Lancers**, and admirably adapted for private  
 use, with *Show Cards for the Trade*.

**Lancet Hones,** No 1—4 inches

2-6 "

## Circular Wheels

## Slips and Pencils.

Square, Oblique, Pointed, Rounded, for  
Gauges, Parting Tools, &c

## Arkansas Oilstone,

(For Gravers. &c.)

Immensely hard, pure and fine cutting.

# In Hones

Der Herr Pfarrer, Hr. Dr. Prütz wird verabschiedet und man bewahrt ihm sehr  
unerschütterten Glauben seiner Sache an, jedoch zu weihen. Die Thurnburg  
hat und die Gegend immer mehr an's Leben und Leben der Thurnburg  
Der Herr Pfarrer, Hr. Dr. Prütz wird verabschiedet und man bewahrt ihm sehr

1.



# PEACOCK'S

## ANTI-SARGASSIAN CONSERVATIVE PAINT,

FOR THE

### BOTTOMS OF IRON, WOOD, OR COPPERED VESSELS.

#### YACHTS, BARGES, BOATS, BUOYS, BEACONS, PILES, &c.

ALSO FOR PRESERVING RAILWAY SLEEPERS AND FENCE POSTS.

#### TESTIMONIALS AND LIST OF AGENTS.

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London—G. Seymour, Sun Court, Cornhill.  
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Hull—Benjamin Bee.  
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Cardiff—N. B. Calder.  
Cowes—M. Ratsey, Yacht Builder.  
Gosport—J. Laphorn.  
New York—F. W. Whittell.

#### Application of the NEW PRIMING to Sugar Moulds.

Sugar Refinery, Southampton, April 14, 1851.

Dear Sir,

We have been using your *New Priming* for the sugar moulds in our Refinery now for some time, and find that one coat of it covers equal to three of the paint previously employed: further, that it dries rapidly, and enables the sugar to be turned out with unerring celerity, the loaves quitting by their own gravity upon being reversed. The flesh color is no disadvantage; and we have much pleasure in recommending it, both for economy and utility.

Your's truly,

JOHN CRAVEN, and Co.

Capt. George Peacock,  
Southampton Docks.

#### ON COPPER SHEATING.

Southampton, 7th March, 1850.

Dear Sir,

Your Composition was applied to the R. M. S. P. *Trent*, in December last, and since then she has made a trip to the West Indies, and experienced very bad weather, which appears to have had no effect on the Composition, and it is this day as perfect, clean and slippery, as the day it was applied. It certainly has been severely tried, and stood right well.

I remain, dear Sir, your's truly,

(Signed) WILLIAM CLARK, Commander.  
CAPTAIN PEACOCK, Southampton.

Northfleet Dockyard, 23rd May, 1850.

CAPT. GEO. PEACOCK,

Dear Sir,

I have made a careful examination of the sheets of copper coated with your Composition in November last on the bottom of the Royal Mail Steam Ship *Teviot*, (now in dock here), and have much pleasure in informing you that the two patches in the wake of the starboard paddlewheel, (where fouling always takes place, more or less on copper), are nearly free from the small coralline worm-shell, there being merely a few little ones here and there upon the surface, whereas, the adjoining sheets of copper on every side are densely covered with worm-shell, barnacles, small oysters, &c.; and it is my opinion that if the copper had been so painted throughout, and allowed time to dry, (the patches having been laid on just before the water was let into the dock) it would have prevented those creatures from adhering. The sheets of copper on the other parts of the bottom, painted with your composition, were found to be perfectly clean, and free from oxidation, although the prevention of oxidation I do not think is so plainly developed, as in the case of the sheet taken from the *Avon* last month, but that vessel had made an additional voyage to the West Indies, more than the *Teviot*, since the paint was laid on.

Wishing you every success in the general application of your valuable discovery,

I remain, dear Sir, your's truly

(Signed) HENRY S. PITCHER.

R. W. I. Mail Steamer, *Avon*,

Southampton, 17th April, 1851.  
CAPT. PEACOCK,

Dear Sir,

The trial of your Paint on the bottom of the R. W. I. Mail Steamer, *Avon*, under my command, has turned out very satisfactory. After going over a distance of upwards of 60,000 miles since it was laid on, the painted sheets were found to be quite fresh, clean, and slippery; with no appearance of external oxidation; whilst the unpainted portion of the sheathing (copper) was honeycombed, worn very thin, and exceedingly rough. The difference in weight, upon stripping and weighing the adjoining sheets of painted and unpainted, being 73 per cent. in favor of the painted ones. The sheets done were near the stem, about six feet from the garboard, and some portion of the sheathing near the water line, was even more worn than that adjoining the painted sheets.

(Signed) THOS. HAST, Lieut. R.N.  
Commander.

#### ON IRON SHIPS.

Peninsular and Oriental Steam Navigation  
Company's Offices,—57, High-Street,  
Southampton, Feb. 21st, 1850.

GEORGE PEACOCK, Esq.

Dear Sir,

I have carefully inspected the *Euxine*, now in Mr. White's Dock, at Cowes, and the general appearance of her bottom is most satisfactory, confirming my former opinion of your Composition.

This is now the second Vessel we have tested, having been coated for six months, and removes from my mind any doubt as to its ultimate success.

Continue to prepare the Composition for our vessels: the quantity you know required for each vessel.

I remain, dear Sir, your's faithfully

(Signed) J. R. ENGLEDEUE.

P. & O. S. N. Company's Steam Ship *Ripon*,  
Southampton, 28th May, 1850.

Dear Sir,

Your Composition has now been in use on the P. and O. Company's Steam Ship *Ripon*, under my command, for about Twelve Months, and I am quite satisfied that it is the best preparation for keeping the bottoms of iron ships clean that I have ever met with. The last coating was put on two months since over a coat of your *New Priming*, and the bottom, after a voyage to Malta and Alexandria, in the worst season of the year for fouling, is now looking beautiful, not the least sign of vegetation or anything else; indeed it has all the appearance of being newly laid on, although it has not been touched since the ship came out of Dock. I am also of opinion that from its slippery surface the speed of the vessel has been increased. The last coat was on Six Months, and upon examination the flat of the bottom was found to be perfectly clean; there was, however, a coating of grass at the ends of the vessel, and from her load line to the turn of the bilge before the paddle wheels, but no barnacle or other shell fish on any part of her; and she had completed two voyages to Alexandria without her speed being affected in the least.

I am, dear Sir, your obedient Servant,  
(Signed) ROBERT MORESBY,  
Captain India Navy,  
Commanding P. & O. S. *Ripon*.

CAPT. GEO. PEACOCK.

Steam Ship, *Sultan*,

Southampton, January, 22nd, 1850.

CAPT. GEORGE PEACOCK,

Dear Sir,

I have much pleasure in stating, that since the use of your Composition on the bottom of the Steam Ship *Sultan*, under my command, on the Constantinople line, from this port, now a period of upwards of four months, the bottom has kept perfectly clean, which we were never able to effect, by any preparation previously used. And I am further of opinion, that from the slippery nature of the Composition, the speed of the Ship is increased.

I am, dear Sir, your obedient Servant,  
(Signed) GEORGE BROOKS, Commander.

Price of the Composition and New  
Priming, 70s. per cwt.

#### ON WOOD BOTTOMS.

St. Mawes, near Falmouth, 20th August, 1850.

Sir,

I feel it my duty to bear testimony to the excellence of your invaluable Composition. It is ten weeks since I applied it to the bottom of my vessel, the *Harriet* (Pilot Sloop, No. 1.) during which time it has not been the least fouled with weed or any other substance, but has kept perfectly clean; this I never found before, for notwithstanding I have tried various things, yet have I been obliged invariably to clean the bottom every fortnight: if left a month I have found great difficulty to clean it, the accumulation being so thick and so strongly adhesive. I am also of opinion, from the nature of the Composition, that it is not only a preventative to such accumulations, but, from its slippery nature, tends greatly to accelerate the speed of the vessel.

Wishing you success in the application of an invention which cannot but be beneficial to all vessels,

I am, dear Sir, your most obedient Servant,  
(Signed) NICHOLAS VINCENT,  
No. 1, Pilot, Falmouth.

To Capt. G. Peacock.

Bury, near Gosport, 15th Oct. 1850.

CAPTAIN PEACOCK,

Dear Sir,

I am so pleased with the success hitherto of your Paint as applied to the bottom of my little vessel, that I cannot lose time in informing you of it. It is now upwards of two months since the paint was laid on, and during that time she has been laying almost idle in the Forton Creek, a locality where weeds, &c. form on vessels' bottoms very rapidly. Within the last few days, I have inspected her bottom, when I found the part covered with your paint perfectly free from weeds or accumulation of any kind, whereas the space done with the ordinary coal tar and turpentine was thickly covered with long weeds and barnacles. I have had an opportunity of calling the Master Attendant of the Royal Clarence Yard to this interesting trial, who was much pleased with what he saw. I purpose also calling the notice of other naval men to the subject. I think it admirably adapted for harbour, ordinary, dockyard boats, and other small craft, particularly yachts laid up for the winter in creeks, and places likely to encourage worms, &c. I shall continue my observations on this interesting subject, and wishing you much success in the general application of your important discovery,

I remain, dear Sir, your's very truly,  
(Signed) H. D. P. CUNNINGHAM, R.N.

Bury, near Gosport,  
April 18, 1851.

My dear Sir,

With reference to my note to you some months since, respecting the successful result of your Paint as applied to the bottom of my little vessel, I have further the pleasure of informing you, that although I have not had an opportunity of getting her on shore to re-coat her for the summer, it is, up to this date, in a very satisfactory condition. A slight accumulation of weed has taken place about the water line, but the general surface of the bottom appears to be very clean; which, considering the length of time (now nearly nine months) since the boat has been exposed to foul water, is really astonishing.

Believe me, dear Sir,  
Your's very truly,  
(Signed) H. D. P. CUNNINGHAM.  
Capt. Geo. Peacock,  
Southampton Docks.

#### EXPENSE OF COATING A COPPERED SHIP, ONE PENNY PER SHEET.

Specimens, illustrating the advantages of this Composition, are now Exhibiting at the CRYSTAL PALACE, Chymical Department, Class 2, South Gallery.



the new machinery about the Atlantic and  
reels and admirably adapted for private

with care

# PEACOCK'S ANTI-SARGASSIAN CONSERVATIVE PAINT.



NONE IS GENUINE THAT DOES NOT BEAR THE SIGNATURE OF THE  
INVENTOR AS ABOVE.

In offering my composition for Ships' Bottoms to the public, I beg to state that it has now been in general use on the iron ships of the PENINSULAR AND ORIENTAL COMPANY, out of this Port, for the last twelve months, and is pronounced by the Superintendents, Commanders, Engineers, and every one connected with that extensive service, who have witnessed the results, as compared with other compositions previously used, to be *the best thing yet tried*. The vessels keep perfectly clean for three months without being touched; afterwards a little green slime begins to collect between wind and water, which at the end of four months, becomes grass, but of very short texture, and offering no impediment to the speed of the vessel. It would however, be advisable to re-coat after four months, as when the grass begins to grow, it proceeds rapidly, and at the end of six months offers some little impediment to the speed; it, however, appears to prevent the growth of muscles, barnacles, coralline, and oysters, even for twelve months.

One of the peculiar qualities of this composition is, that shortly after immersion in salt water decomposition takes place between the two metallic oxides forming its base, and the surface of the paint becomes slimy, like the back of a fish, although adhesive, *adding considerably to the speed of the vessel*; and the germs of weed and testacæ coming in contact with this pasty surface are destroyed: this, in fact, constitutes the cleaning process. *There is no copper in the preparation.*

It is necessary to give the bottom of an iron vessel one or two coats of "priming" or varnish under, to protect the plates from the action of the salt water; red lead or black varnish will do, but the priming I furnish being ground up with oil and beeswax, is a prepared mixture on which the composition dries more readily than over red lead or ordinary black varnish.

By using my Composition, an Iron Ship is enabled to make a voyage to India without losing her speed; where after discharging her cargo, by heeling and re-coating between wind and water, she will be enabled to return to England without docking, as neither grass nor shell-forming animals appear to adhere to the flat of the bottom, and by renewing the "priming" or varnish every twelve months, little or no natural oxidation or corrosion of the plates will take place. On wood-bottom vessels it appears to resist the attack of the "Teredo navalis," and on copper completely protects the sheathing both from oxidation and accumulation of any kind, at the same time giving additional speed by forming a slippery surface.

For Railway Sleepers it will be found very desirable, particularly in Tropical climates, preventing decay and preserving the wood from the attacks of insects, fungus, &c.

Southampton Docks, June 1st, 1850.

GEORGE PEACOCK, Inventor.



## PEACOCK'S ANTI-SARGASSIAN CONSERVATIVE PAINT.

"I have named my composition '*Anti-Sargassian*' from the Spanish word '*Sargazo*,' meaning sea-grass or weed. The '*Sargasso*' or Sargassian Sea, well known to all navigators who have crossed the Atlantic, is a large tract of ocean lying between the latitudes of from 20° to 36° N., and the longitudes 25° to 40° W., where the weed (*Fucus natans*) is so thick in some parts as to impede a vessel's progress in light winds, presenting to the eye from one margin of the horizon to the other the appearance of a boundless inundated meadow. Abundance of small swimming crabs, pediculi, pipefish, hippocampini, &c., exist amongst this weed, which is also covered on its berries and branches with minute zoophytes and coralline incrustations, and I have frequently picked up pieces of wreck and broken spars amongst it covered with barnacles, and eaten through by the '*teredo navalis*.'"

"Columbus in his first voyage of discovery passed through a portion of this sea, subsequently named by him '*El Mar de Sargazo*,' and it is recorded that the Phœnicians became acquainted with this '*weedy sea*,' in their early voyages of discovery to the Atlantes, or Hesperidian Islands of Plato. I have no doubt but that vessels passing through this '*grassy sea*,' receive on their bottoms and wales above the copper, the germs both of weeds and zoophytic animals. Hence the clusters of barnacles, &c., found adhering to them on arrival in Europe, both on the copper and bends, and the latter are too frequently found to be pierced by the '*teredo*,' although the vessel may have loaded in a port said to be free from this destructive animal."

"The creature which commits such havoc on piles, buoys, boats, &c., in the Southampton waters and other ports of the United Kingdom, does not appear to belong to the vermicular class, but is a small insect resembling a weevil; it forms no shelly concretion like the true '*teredo navalis*,' and confines its ravages to the surface, although gradually destroying the wood, leaving only the knots. A similar insect exists in the Bay of Callao (port of Lima) and in Halifax (Nova Scotia) which is found to be very destructive to piles, buoys, &c."

GEORGE PEACOCK, Dock Master, Southampton.

SPECIMENS MAY BE SEEN AT MR. GEORGE SEYMOUR'S, SUN COURT, CORNHILL.

### SOLE AGENTS.

London—Geo. Seymour, Sun Court, Cornhill  
 Liverpool—Stoddart & Co., Strand St.  
 Dublin—Wight Pike, Dublin Insurance Office  
 Bristol—Whitwell & Allward  
 Plymouth—Thos. Russell  
 Swansea—R. Maine.

Falmouth—E. Gilbert  
 Hartlepool—George Denton  
 Weymouth—J. Cosens  
 Sunderland—W. Barber  
 Southampton—J. R. Stebbing & Mrs. S. H. Wolf

### PRICE OF THE PRIMING AND PAINT.

Delivered in London or the Country, 70s. per cwt. including packages, with 5 per cent. discount for cash, for quantities from 1 cwt. and upwards. Delivered at the Southampton Docks, 60s. per cwt. exclusive of packages—cash, for quantities not less than 5 cwt. No allowance for returned packages.  
 One cwt. will cover for first coat 3,000 superficial feet on wood or iron, or 4,000 on copper; and for second coat one-third greater surface.

THE EXPENSE OF COATING A COPPERED SHIP, INCLUDING THE LABOUR, IS ONE PENNY PER SHEET.

### TESTIMONIALS.

South-Western Steam Company's R. M. Steamer *Courier*.  
 Southampton, May 24th, 1850.

Dear Sir,—I have now had your Composition on the bottom of the South-Western Railway Company's Iron Mail Packet, *Courier*, running between this Port and the Channel Islands, for the last ten weeks. It was laid on whilst the vessel was dry, in one tide.

without docking, over three coats of coal tar and turps, and is still as clean and free from weed and rust as the first moment the Composition was laid on.

On Wednesday last the water was remarkably clear at Jersey, and I could see down to the lower part of the keel, where there was a portion, about five inches deep and ten feet long, payed with coal tar, and omitted to be coated with your Composition, this I observed to be covered with weed about two inches long.

Owing to the slippery surface of your Composition the vessel's speed has been increased about half an hour on each passage, thereby effecting a saving of fuel in proportion to the time saved, which also corresponds with the extra speed shown by the Rev. E. L. Berthon's Perpetual Log, which I have had in use for the last twelve months.

Wishing you every success, I remain, yours, &c.,

(Signed) J. GOODRIDGE, Jun., Commander of the *Courier*.

To Capt. G. Peacock.

South-Western Steam Company's Steamer *Dispatch*.

Southampton, May 27th, 1850.

My Dear Sir.—I have much pleasure in certifying that I have now had your Composition on the bottom of the Iron Mail Steam Packet *Dispatch*, under my command, running between Southampton and the Channel Islands, for the last thirteen weeks, and having seen down to the keel, at Jersey, last voyage, I find it still perfectly clean; and I further certify that since its application the speed of the vessel has been considerably increased, the voyages being made quicker each way, and the consumption of fuel much lessened. I attribute this to the slippery surface which your composition forms—feeling to the hand like the slime on a fish.

In one tide (20th Feb. last), the Composition was laid on, by putting the ship on the gridiron, and there is no difficulty in the application, it being laid on cold like common paint.

Wishing you every success, I remain, &c.,

GEORGE BABOT, Commander of the *Dispatch*.

To Capt. G. Peacock.

P. & O. S. N. Company's Steam Ship *Ripon*,

Southampton, 28th May, 1850.

Dear Sir.—Your Composition has now been in use on the P. and O. Company's Steam Ship *Ripon*, under my command, for about twelve months, and I am quite satisfied that it is the best preparation for keeping the bottoms of iron ships clean that I have ever met with. The last coat was put on two months since over a coat of your new *Priming*, and the bottom, after a voyage to Malta and Alexandria, in the worst season of the year for fouling, is now looking beautiful, not the least sign of vegetation or anything else; indeed it has all the appearance of being newly laid on, although it has not been touched since the ship came out of dock. I am also of opinion that from its slippery surface the speed of the vessel has been increased. The last coat was on six months, and upon examination the flat of the bottom was found to be perfectly clean; there was, however, a coating of grass at the ends of the vessel, and from her load line to the turn of the bilge before the paddle wheels, but no barnacle or other shell fish on any part of her; and she had completed two voyages to Alexandria without her speed being affected in the least.

I am dear Sir, your obedient Servant,

(Signed) ROBERT MORESBY, Capt. I. N.

Commanding P. & O. S. *Ripon*.

To Capt. G. Peacock.

Royal Western Yacht Club,  
Plymouth, July 7th, 1850.

Sir.—I have much pleasure in forwarding you the desired information as to my experience of the properties of your Composition.

The *Leveret* received one coat of it in March last, and on inspecting the bottom three months afterwards, we found no trace of weeds or foulness of any description, this surprised me as I did not consider from the hasty manner in which it was put on, (the tide returning round the vessel before it could have had time to dry along the keel), that it had had a fair trial; a few barnacles were found, but dead, another proof of its efficacy. I should mention that for the first month of the period I have named, the vessel was at her moorings in Cowes Harbour, where she would have been more likely to foul than if under weigh. I have not the slightest doubt that with two coats, a vessel will go at least



four months without requiring cleaning, and from its great simplicity in application, durability, and lowness of price, (one pound's worth covering a 40 ton vessel with *two coats*), I consider it decidedly the best Composition yet discovered; I have recommended it to several friends who have expressed themselves much pleased and surprised at its qualities.

I am Sir, your obedient Servant,

(Signed) N. P. O'SHEE.

Owner of the Yacht *Leveret*.

P.S. I am glad to hear that the *Titanix* has had it applied. My Master told me he had recommended it to Mr. Stephenson's Master. I shall recommend it at this club.

Rochester, 15th August, 1850.

I hereby certify that I have tried some of Capt. Peacock's Composition on one side of my fishing smack the *Elizabeth* in June last, she being employed in the river Medway and neighbourhood, the other side being done at the same time with coal tar, and that in a fortnight the grass grew three to four inches long on the latter, besides lots of barnacles! I then scrubbed that side, and found it just as bad in the next fortnight, whilst the side done with the Composition was still quite clean, and as slippery as a flounder.

I have had to scrub the coal tar side regularly every fortnight, and it is this day as foul as ever, whilst the other side, that has not been touched since the first minute it was put on, is still quite clean and slippery, and has caused much wonder and talk amongst the many fishermen and others who have seen it.

I find that it dries nearly as fast as it is laid on, and requires no warming or other preparation, being ready for immediate use in the package.

(Signed) WILLIAM WILLIAMSON,

Fisherman and Owner of the Smack *Elizabeth*.

St. Mawes, near Falmouth, 20th August, 1850.

Sir.—I feel it my duty to bear testimony to the excellence of your invaluable Composition, it is ten weeks since I applied it to the bottom of my vessel, the *Harriet* (Pilot Sloop, No. 1.) during which time it has not been the least fouled with weed or any other substance, but has kept perfectly clean; this I never found before, for notwithstanding I have tried various things yet have I been obliged invariably to clean the bottom every fortnight, if left a month I have found very great difficulty to clean it, the accumulation being so thick and so strongly adhesive. I am also of opinion, from the nature of the Composition, that it is not only a preventative to such accumulations, but, from its slippery nature, tends greatly to accelerate the speed of the vessel.

Wishing you success in the application of an invention which cannot but be beneficial to all vessels.

I am, dear Sir, your most obedient Servant,

(Signed) NICHOLAS VINCENT,

No. 1, Pilot, Falmouth.

To Capt. G. Peacock.

P. & O. S. N. Company's Steam Ship *Indus*,  
Southampton, August 26th 1850.

Dear Sir.—I have much pleasure in certifying that your Composition has been in use on the bottom of the Peninsular and Oriental Company's Steam Ship "*Indus*," under my command, running between Southampton and Alexandria, now for a period of upwards of a year, and I have no hesitation in stating it to be the best Composition I have ever met with for keeping the bottom clean; I also believe that independent of its cleaning properties, its slippery surface enables the ship to pass more swiftly through the water:—your last Improved Composition, over a coat of the *new priming*, has now been on nearly four months, during two voyages to Malta and Alexandria (*the most rapid voyages we have ever made*), and the surface is still quite perfect, clean and slippery: the water was very clear at Gibraltar on the 16th inst., and enabled us to see down to the keel. The bottom has not been scrubbed in any part since the paint was laid on.

I wish you much success in its general application,

And remain, dear Sir, your obedient Servant,

To Capt. G. Peacock.

(Signed) JOHN SOY, Commander.

The best finishing fluid for stoneware and  
Lancets, and admirably adapted for private  
use, with Show Cards for the Trade.

Lancet Hones, No 1—4 inches

Circular Wheels  
Slips and Pencils.  
Square, Oblique, Pointed, Rounded, for

Arkansas Oilstone,  
(For Gravers, &c.)  
Immensely hard, pure and fine cutting.

Fareham, near Portsmouth, October 14th, 1850.

Dear Sir.—I have much pleasure in stating that the Composition you recommended me to use on the bottom of my barque *Hampshire*, after stripping off her copper, answers very well. Although it is nearly *five months* since it was laid on, she having made a voyage to Quebec and back, her bottom is *very clean*, and it has likewise *added to her speed* in sailing; it does not require doing again yet, although it only had one coat; the rudder being unshipped at the time was omitted to be done, and on arrival at Quebec, the captain informs me it was quite grassy, but the bottom quite free from anything of the sort.

If you think the above of any service to you, you are quite free to make use of it. Pray send me another cwt. of the Composition, with the invoice, and believe me,

Your's truly,

(Signed)

HENRY CLARK.

Owner of the barque *Hampshire*.

To Capt. G. Peacock.

Peninsular and Oriental Steam Navigation Company's Offices,  
London, January 15th, 1850.

Sir.—In compliance with the request contained in your note of yesterday's date, the Managing Directors instruct me to forward to you herewith, copies of the reports which have been made to them by the Company's Superintendent at Southampton, of the results which have hitherto been attained by the application of your "*Anti-Sargassian*" paint, to the bottoms of iron steam vessels belonging to this Company.

I am, &c.,

RICHARD ANDREWS,

For the Managing Directors.

To Capt. G. Peacock.

Peninsular and Oriental Steam Navigation Company's Offices,  
Southampton, November 1st, 1849.

Gentlemen,—In reply to your letter of the 30th ult., I beg to forward a report on Mr. George Peacock's Composition for the bottoms of iron ships. The first ship regularly coated with the Composition was the *Ripon*, on the 3rd of June, 1849, when she was done on the starboard side with one coat over a coat of the "*Patent Alkali Company's*" purple brown paint, the original red lead not being scraped off; the opposite side, or *port side*, was done with the usual two coats of red lead and arsenic. She came out of dock on the 8th of June, and left for Alexandria on the 20th, returning to Southampton about the end of July, at which time Mr. Peacock's side was quite clean, whilst the opposite side was covered with long thick grass, which was then scraped off four feet down from the water line, and re-coated with red lead, the ship being heeled for the occasion. She left for Alexandria again on the 20th of August, and before leaving that port it was found necessary again to heel her and scrape the *port side* as before.

On her arrival at Southampton (4th of October) she was docked, when the *port side* was found to be *again covered all over* with long thick grass and bunches of barnacles, whilst the *starboard side* was quite free from grass, although there were a few small barnacles here and there upon it. This side had not been touched since the Composition was laid on in June; the plates on both sides were found perfectly free from oxidation.

The *Pacha* was done with one coat of Mr. Peacock's Composition in July, on both sides over one coat of red lead. She proceeded on her usual Peninsular voyage, and returned to this port *quite clean*, remaining so (where visible) up to the hour of leaving, and a letter from her Commander, received a few days ago from Lisbon, states that he saw down to the keel in clear water at Vigo, and that she remains perfectly clean below. The *Euzine* was done with it in the early part of August, over a coat of red lead, and left for Constantinople on the 29th of that month; she was docked on her return (11th of October) for the express purpose of examining her bottom, when it was found to be perfectly clean and free from oxidation, not even requiring to be washed down. When the *Sultan* was docked, the early part of September, a coat of



Mr. Peacock's Composition was laid on upon trial, at his own request, without any intervening coat of red lead or other paint. She left for Constantinople on the 29th of September, is due here on the 6th instant, and will be docked about the 8th, for the express purpose of examining her bottom.\* The remainder of the Company's Iron ships have been all done with Mr. Peacock's Composition. I am of opinion this Composition is by far the best yet produced for keeping clean the bottoms of iron steamers, being inexpensive and a decided preservative of iron. As to the number of months it will retain its powers, remains yet to be seen; one great advantage is, that the Composition dries as fast as it is laid on, and is about the same price as red lead, considering the difference of quantity required.

I am, &c.

J. R. ENGLEDDUE, Superintendent.

To the Managing Directors of the Peninsular and Oriental Steam Navigation Company.

Peninsular and Oriental Steam Navigation Company's Offices,  
Southampton, January 9, 1850.

Gentlemen,—The *Pacha*, coated with Capt. Peacock's Composition, is now in dock, and I have to report that the bottom, after *six months'* trial, exhibits the appearance as follows:—

From the keel to seven feet upwards, the ship is as clean as the day she was coated, and no appearance of rust beyond that which is usual when coated with red lead only. For about three feet from the seven feet mark upwards, or say a foot below her light load line, the grass had grown half an inch, but no barnacle or other foreign substance; the whole of which could have been scrubbed off and recoated by listing the ship.

I consider now the value of this Composition fully established.

The commander reports to me the speed to have kept up during the whole period, or in fact she had gone *faster* than before.†

We have never been able to keep any of our iron vessels clean for a longer period than a month, or six weeks, until the application of Capt. Peacock's Composition.

The *Sultan*, just now arrived, and in fact the whole of our iron vessels upon arrival, present a most satisfactory appearance, and the commanders unanimously report their voyages accelerated by the use of this Composition.

I am, &c.,

J. R. ENGLEDDUE, Superintendent.

To the Managing Directors, London.

Docks, Southampton, January 17th, 1850.

Dear Sir,—The *Pacha*, P. & O. Company's iron steamer, under my command, having been docked in July last, and coated with your Composition, was again docked, for the purpose of examining the bottom, on the 6th inst., and I have much pleasure in informing you, that the whole body of the ship submerged, within one foot of light water mark, was entirely free from grass, barnacles, or any other marine substance whatever; and the little rust which appeared was not more than we have previously found when using red lead. The accumulation of grass, between wind and water, was not greater, during the above interval, than I have previously found in a voyage of three weeks' duration; and I am of opinion that her speed is increased by the application of your Composition, from its slippery surface.

Wishing you much success in the general application of your valuable invention to all classes of vessels,

I remain, dear Sir, your obedient Servant,

(Signed) JOHN WEEKS,

Commander of P. & O. Co.'s *S. Pacha*.

To Capt. G. Peacock.

\* The *Sultan* was docked on the 8th of November, examined by a Government officer from Somerset House, and found perfectly clean from her water line to her keel.

† The surface of the Composition, shortly after immersion, becomes slippery like the back of a fish.

Steam Ship *Sultan*, Southampton, January 22nd, 1850.

Dear Sir,—I have much pleasure in stating, that since the use of your Composition on the bottom of the steam ship *Sultan*, under my command, on the Constantinople line, from this port, now a period of upwards of four months, the bottom has kept perfectly clean, which we were never able to effect by any preparation previously used. And I am further of opinion, that from the slippery nature of the Composition, the speed of the ship is increased.

I am, dear Sir, your obedient Servant,  
(Signed) GEORGE BROOKS, Commander.

To Capt. G. Peacock.

Peninsular and Oriental Steam Navigation Company's Offices,  
57, High-street, Southampton, February 21st, 1850.

Dear Sir,—I have carefully inspected the *Euxine*, now in Mr. White's Docks, at Cowes, and the general appearance of her bottom is most satisfactory, confirming my former opinion of your Composition.

This is now the second vessel we have tested, having been coated for six months, and removes from my mind any doubt as to its ultimate success.

Continue to prepare the Composition for our vessels: the quantity you know required for each vessel.

I remain, dear Sir, your's faithfully,  
(Signed) J. R. ENGLEDDUE.

To Capt. G. Peacock.

Southampton, March 7th, 1850.

Dear Sir,—Your Composition was applied to the R. M. S. P. *Trent*, in December last, and since then she has made a trip to the West Indies, and experienced very bad weather, which appears to have had no effect on the Composition, and it is this day as perfect, clean and slippery, as the day it was applied. It certainly has been severely tried, and stood right well.

I remain, dear Sir, your's truly,  
(Signed) WILLIAM CLARK, Commander.

To Capt. G. Peacock.

Southampton, March 21st, 1850.

Dear Sir.—I am happy to inform you that I have now had your Composition on the bottom of the *Clara*, trading between Sunderland and this port, for nine months, and find on examination, that it is free from barnacles and weed, and has never been scrubbed during that time. We found a few barnacles adhering to some of the seams where the stuff had got rubbed off. Previous to the use of your Composition, we found it requisite to clean the bottom every two months, in the summer season. Your Composition appears to me to be the best and most economical, that I have met with yet.

I shall require 1 cwt. more of it for another coat. Wishing you every success.

I remain, Sir, your's respectfully,  
(Signed) ROBERT ATKIN,  
Commanding the Brig *Clara*.

To Capt. G. Peacock.

R.M. Steam Ship *Avon*, Southampton, 1st May, 1850.

Dear Sir.—I have very great satisfaction in stating to you that the sheets of copper painted with your Composition, on this ship's bottom, in August last, were found to be perfectly clean on her becoming dry in the Graving Dock, on Saturday last, after a period of eight months, during which time they have not been touched, and the ship has performed two voyages from this port to the West Indies, and Gulf of Mexico; the copper so painted was found to be free from oxidation, and a piece being cut out at the centre of one of the new sheets, (one half of which only had been coated), shews the part of the sheet, so coated, considerably raised on the surface above the other, and of the full original thickness of the copper, whilst the unpainted portion was worn away



by oxidation nearly one-third of its substance. The specimen in question I consider quite a curiosity, the wave-line of the paint brush being clearly defined in high relief.

Wishing you the success which so valuable a discovery deserves, for preserving copper sheathing from wear and fouling,

I remain, dear Sir, very sincerely yours,  
(Signed) PHILIP HAST, Lieutenant, R.N.  
Commander.

To Capt. G. Peacock.

We the undersigned, hereby certify that the *John Lee*, Steam Tug, employed in the Solent and Southampton Waters, was painted on the Port Side of her bottom, with Capt. Peacock's Composition, in February, 1849, and the starboard side was coated at the same time with coal tar and turps. On examining her bottom in the Dry Dock, on the 2nd inst., after a period of *fourteen months*, the starboard side was found to be completely covered with large bunches of muscles, barnacles, and weeds; whereas, on the port side, there was nothing but slimy weeds, except on a small round patch, where one of the bilge shores had not been removed, upon which was found a large bunch of muscles and barnacles, (*this spot had not been painted.*) The appearance of the bottom accounted for the vessel's bad steerage and dullness for the last few months. We further declare that neither side of the vessel's bottom had been touched or cleaned during the above period.

Given under our hands, on board the *John Lee* Steam Tug, at Southampton, May 7th, 1850.

(Signed) FRANCIS TREADWELL, Master.  
JOSEPH HODGKINSON, Engineer.  
ROBERT C. HEADLEY, Mate.

To Capt. G. Peacock.

*Northfleet Dockyard, 23rd May, 1850,*

Dear Sir.—I have made a careful examination of the sheets of copper coated with your Composition in November last, on the bottom of the Royal Mail Steam Ship *Teviot*, (now in dock here), and have much pleasure in informing you that the two patches in the wake of the starboard paddle-wheel, (*where fouling always takes place, more or less on copper*), are *nearly* free from the small coralline worm-shell, there being merely a few little ones here and there upon the surface, whereas, the adjoining sheets of copper on every side, are *densely covered with worm-shell, barnacles, small oysters, &c.*; and it is my opinion that if the copper had been so painted throughout, and allowed time to dry, (the patches having been laid on just before the water was let into the dock), it would have prevented those creatures from adhering. The sheets of copper on the other parts of the bottom, painted with your Composition, were found to be *perfectly clean, and free from oxidation*, although the prevention of oxidation I do not think is so plainly developed, as in the case of the sheet taken from the *Avon's* bottom last month, but that vessel had made an additional voyage to the West Indies, more than the *Teviot*, since the paint was laid on.

Wishing you every success in the general application of your valuable discovery,

I remain, dear Sir, Your's truly,  
(Signed) HENRY S. PITCHER.

To Capt. G. Peacock.

P. & O. C. S. Vessel, *Euxine*,  
*Southampton Docks, 24th May, 1850.*

Sir.—Since the application of your Composition, on the P. & O. Co.'s Steamer *Euxine*, under my command, I have found from the slippery nature of it, that the speed of the ship has increased; and I am of opinion that it is the best preventative against the growth of vegetation, and general fouling on iron ship's bottoms, that has hitherto been used. It has now been on *three months*, during which time I have made a voyage to Constantinople, and, as far as I can see, it appears to be perfectly clean.

I am, Sir, your's &c.,  
(Signed) R. W. EVANS,  
Commander.

To Capt. G. Peacock.

*Personal & official*



the new spinning mangle for private  
fanciers, and admirably adapted for private

Spinning Wheels





# LIQUIDES REVIVIFICATEURS

(dit Chrysopalingénésiques)

DE ROSSELET, INVENTEUR

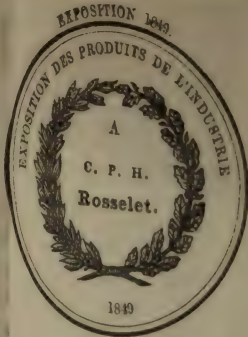
ET FABRICANT DE PRODUITS CHIMIQUES

POUR LA REVIVIFICATION DES DORURES & ARGENTURES SUR TOUS METAUX, BROCARD, EQUIPEMENTS MILITAIRES, BRODERIES, PASSEMENTERIES, &c. ;

Seul admis, pour ce Genre d'Industrie, à l'Exposition Générale des Produits de l'Industrie Nationale de 1844 et 1849, admis à l'Exposition Universelle de Londres, sous le No. 1452.

Fournisseur Breveté du PRINCE DE JOINVILLE.

Chez ROSSELET, rue de la Madeleine, 3, Ci-devant rue du Faubourg Saint-Honoré, 26.



M. ROSSELET est parvenu, après de longues recherches à composer deux LIQUIDES, auxquels il a donné le nom de (**Revivificateur ROSSELET**).

Ces Liquides rendent aux Dorures et Argentures altérées, défraîchies et oxydées, leur éclat primitif et toute leur fraîcheur. Aucun acide n'entre dans leur composition, et le résultat obtenu n'est sujet à aucune altération.

A l'aide de ces Liquides, on peut désormais échapper aux délais nécessaires aux doreurs pour remettre à neuf les objets qui leur sont confiés on peut opérer soi même.

Au moyen de l'un d'eux, on restaure les Pendules, Lustres, Candélabres, Bronzes dorés par les anciens et nouveaux procédés, Bijoux vrais ou faux (sans altérer les pierres), or et argent mat ou bruni, Argentures.

Il n'oxyde aucun métal. Les horlogers l'emploient avec le plus grand succès pour le nettoyage des mouvements.

Le second de ces Liquides est destiné à remettre à neuf les Ornaments d'église, Brocard, Broderies or et argent sur uniforme et tous autres, Equipements militaires, Epaulettes, Broderies, Passementeries, etc., etc.

Les travaux importants exécutés dans la cathédrale de Rheims, dans les églises de la Madeleine, de Saint-Méry, de Saint-Louis d'Antin et de Saint-Thomas-d'Aquin, pour la restauration des principaux autels et ornements; dans plusieurs ambassades: la remise à neuf d'Equipements militaires, d'un nombre considérable d'uniformes, de Broderies diverses, ainsi que des travaux de restauration faits dans établissements publics importants, ont tous mérité au sieur ROSSELET des témoignages authentiques de haute satisfaction.

RAPPORT DU JURY CENTRAL DE L'EXPOSITION NATIONALE DE 1849.

## Revivification des Dorures, Reparation de la Bijouterie et des Bronzes Dorés.

M. HERICART, de THURY, Rapporteur.

"M. Rosselet, Inventeur, fabricant de Produits chimiques, rue du Faubourg-Saint-Honoré, 26, à Paris.

"M. Rosselet a présenté au Jury central deux Liquides qu'il a nommés *Chrysopalingénésiques* ou *Revivificateurs* de Dorures et Argentures, l'un pour les métaux, l'autre pour les Equipements militaires, Passementeries, Broderies, etc.

"La Commission mixte des beaux-arts et de chimie s'est assurée d'abord qu'il n'entraînait aucun acide dans la composition des deux Liquides de M. Rosselet, puis elle les a soumis à diverses épreuves, savoir :

"1<sup>o</sup> Sur des pièces d'or, de vermeil, d'orfèvrerie, des bijoux d'or vrais ou faux, des armés, des bronzes dorés; et 2<sup>o</sup> sur des ornements d'église d'or, d'argent et dorés, sur des uniformes et équipements militaires,

"Et par ses essais elle a constaté que les deux Liquides revivifient réellement, sans oxydation de métaux comme sans altération des étoffes, l'or et l'argent mats

Monseigneur l'archevêque de Rheims, Monsieur le curé de Saint-Méry, des amiraux, des généraux, enfin un grand nombre d'officiers supérieurs des armées de terre et de mer, des ingénieurs civils et militaires, en daignant accorder au sieur ROSSELET des certificats aussi honorables que flatteurs, l'ont dignement récompensé de ses travaux et de ses laborieuses recherches.

Ces Liquides peuvent être conservés et voyager sans éprouver aucune altération.

L'Inventeur se charge de la restauration ou revivification de tous les objets ci-dessus énoncés.

Chaque Flacon, revêtu du cachet et de la signature de l'Inventeur est accompagné d'une Instruction sur la manière de se servir du Liquide.

PRIX DU FLACON: francs, pris à Paris; chaque Flacon est de la contenance d'un double décilitre.

On fait des Envois en France et à l'Etranger. Ecrire franco chez l'Inventeur, rue de la Madeleine, 3 (ci-devant rue du Faubourg Saint-Honoré, 26), ou à son dépôt chez M. LEFAUCHEUX, Armurier, rue Vivienne, 37, à Paris, et à Londres.

Le Flacon pour les métaux est revêtu d'un cachet rouge, celui pour les Broderies, Epaulettes et Passementeries, etc., d'un cachet vert.

A l'aide d'un Procédé que possède l'Inventeur, il nettoie et revivifie les cadres et dorures sur bois.

# LIQUID REVIVIFICATORS,

(called Chrysopalingenesics)

OF ROSSELET, INVENTOR & MANUFACTURER OF CHEMICAL PRODUCE,

For the Revivification of Gildings and Silverings on all Metals, Brocade, Military Equipments, Embroideries, Lace, &c.

He was the only one sanctioned in this kind of Industry, at the General Exhibition of the products of the National Industry in 1844 & 1849; they have admitted them in the London Universal Exhibition, and bear the number 1452, in the French department. PATENTED, PURVEYOR TO THE PRINCE OF JOINVILLE.

ROSSELET, rue de la Madeleine, 3, formerly rue du Faubourg Saint-Honoré, 26.

M. ROSSELET has, after painful researches, composed two LIQUIDS, to which he has given the name of **Revivificator Rosselet**.

Those Liquids give to the gildings and silverings faded, soiled, and oxyded, their original brightness and all their freshness.

No acid is used in their composition, and the effect obtained is not subject to any alteration afterwards.

To the aid of those Liquids, people will be no more at the mercy of gilders when they want to brighten up their goods, since they now can do it themselves.

Are restored by the means of one of the Liquids aforesaid, Time-pieces, Chandeliers, Candelabras, Bronze-gilt (by the new or old process), Jewels, real or false (without removing the stones), Gold and Silver, unpolished or polished, Silverings, etc.

It does not oxyde any metal. The clockmakers make use of it with great success for the cleaning of the works.

The other of these Liquids causes the Church Ornaments, Brocades, Embroideries in Gold or Silver, on Uniforms of all sorts, Military Equipments, Epaulets, Embroideries, Lace, etc., etc., to appear like new.

The important labours executed in the Cathedral of Rheims, in the Churches of La Madeleine, of Saint Méry, of Saint-Louis d'Antin, and of Saint-Thomas-d'Aquin, for the restoration of the principal altars and ornaments, at several embassies. The cleaning equal to new of Military Equipments, of a considerable number of Uniforms, of divers Embroideries, as well as important works in

public establishments—all have merited to M. ROSSELET authentic testimonials of great satisfaction.

My Lord the Archbishop of Rheims, Monsieur the Rector of St. Méry, Admirals, Generals, and a great number of Superior Officers, civil, military and naval, in granting to M. Rosselet certificates as honourable as gratifying, have worthily rewarded him for his labours and laborious research.

These Liquids can be preserved and conveyed without experiencing any injury. The Inventor will take charge of the restoration and revivification of all the objects above named.

Each bottle bears the seal and signature of the Inventor; it is accompanied with an instruction, showing the way of making use of the Liquid.

PRICE OF THE BOTTLE: Francs, in Paris; each bottle is of the contents of a double decilitre.

Invoices are made in France, and in foreign parts. Apply, by letter free, to the Inventor, Rue de la Madeleine, 3 (late Rue du Faubourg Saint-Honoré, 26), or to his dépôt, at M. LE FAUCHEUX'S, Gunsmith, Rue Vivienne, 37, at Paris, and at London.

The bottle for the metals has a red seal; the one for the embroideries, epaulets, and lace, etc., a green one.

The Inventor possesses also the means of cleaning and revivifying the frames and gildings on wood.

REPORT OF THE CENTRAL JURY OF THE NATIONAL EXHIBITION OF 1849.

## Revivification of Gildings, Repair of Jewellery and Bronze Gilt.

Mr. HERICART de THURY, Reporter.

"M. Rosselet, Inventor, Manufacturer of Chymical Produce, Rue du Faubourg Saint-Honoré, 26, Paris.

"M. Rosselet has presented to the Central Jury two Liquids, which he has called *Chrysopalingénésiques*, or *Revivificators* of Gildings and Silverings—the one for Metals, the other for Military Equipments, Lace, Embroideries, etc.

"The mixed Commission of the Fine Arts and Chemistry has convinced itself, in the first instance, that no acid had been introduced in composing the two Liquids of M. Rosselet: then it has submitted them to several experiments, namely:

"1<sup>o</sup> On gold and silver gilt, goldsmith's ware, jewels in gold plated, arms, bronze-gilt; and 2<sup>o</sup> on Church ornaments in gold, silver, and gilt, uniforms and military equipments.

"And by essays made, the Commission is perfectly satisfied that the two

Liquids revive, undoubtedly, without oxidation of metals, as well as without alteration of stuffs, gold and silver, unpolished or polished; and, moreover, it is attested on one side by the testimonials of my Lord the Archbishop of Rheims, of MM. the Rectors of the Parishes of the Madeleine, of Saint-Méry, etc.; and, on the other side, the testimonials of a great number of Generals, Admirals, and Superior Officers of the Army and Navy."

At the Exhibition of 1844, the Central Jury had granted M. Rosselet for his Liquids, Revivificators of Gildings and Silverings, an honourable report, in expectation that the use of them would be known, and the success more generally attested.

The new Report of the next Commission of Fine Arts and Chemistry combined, seeing that now no doubt exists upon the efficacy and the full success of the Liquids of M. Rosselet; and, besides numerous testimonials certifying it, the Central Jury has presented him with the Bronze Medal.



# FLUIDS REVIEW

DEPARTMENT OF THE ARMY  
HEADQUARTERS, WASHINGTON, D.C.  
JANUARY 1, 1918



THE FOLLOWING IS A SUMMARY OF THE  
RESULTS OF THE SURVEY OF THE  
FLUIDS REVIEW, CONDUCTED BY THE  
DEPARTMENT OF THE ARMY, DURING  
THE YEAR 1917. THE SURVEY WAS  
CONDUCTED BY THE DEPARTMENT OF  
THE ARMY, AND THE RESULTS WERE  
PRESENTED TO THE SECRETARY OF  
WAR, IN A REPORT DATED JANUARY  
1, 1918. THE RESULTS OF THE  
SURVEY WERE AS FOLLOWS:

1. THE SURVEY WAS CONDUCTED BY  
THE DEPARTMENT OF THE ARMY, AND  
THE RESULTS WERE PRESENTED TO  
THE SECRETARY OF WAR, IN A  
REPORT DATED JANUARY 1, 1918.

2. THE SURVEY WAS CONDUCTED BY  
THE DEPARTMENT OF THE ARMY, AND  
THE RESULTS WERE PRESENTED TO  
THE SECRETARY OF WAR, IN A  
REPORT DATED JANUARY 1, 1918.

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THE DEPARTMENT OF THE ARMY, AND  
THE RESULTS WERE PRESENTED TO  
THE SECRETARY OF WAR, IN A  
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THE SECRETARY OF WAR, IN A  
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REPORT DATED JANUARY 1, 1918.

10. THE SURVEY WAS CONDUCTED BY  
THE DEPARTMENT OF THE ARMY, AND  
THE RESULTS WERE PRESENTED TO  
THE SECRETARY OF WAR, IN A  
REPORT DATED JANUARY 1, 1918.

RAW MATERIALS.

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CLASS III.

SUBSTANCES USED AS FOOD.



THE NEW YORK PUBLIC LIBRARY  
ASTOR LENOX TILDEN FOUNDATION  
500 5TH AVENUE  
NEW YORK 17, N.Y.

Le mouton *entier* conservé par M. Appert (15, Rue des 3 bornes à Paris), est complètement desossé, et farci, pour lui conserver sa grosseur naturelle, il a été braisé de sorte que dans la boîte de fer blanc qui le renferme, il est ce qu' est un mouton entier depouillé.

On n' a pas encore pu conserver entier un animal de cette grosseur, et l' eut on fait, on ne l' aurait pu sans lui eulver la délicatesse du gout.

En Effet—

1. Pour conserver une substance alimentaire, par la methode de M. Appert, il faut soumettre au bain marie, à vase clos, et la durée de ce bain marie, doit etre en proportion de la grosseur de l' objet qu' on veut conserver.

2. La substance qu' on soumet à cette opération, perd de sa délicatesse, suivant le plus ou moins de temps nécessaire à l' absorption de l' oxygène.

3. C' est au moyen des nouveaux appareils, qu' a inventés M. Appert (et dont 2 années ont consacré l' excellence) qui la conservation de ce mouton a été opérée en très peu de temps; il aura donc toute la saveur qu' il aurait s'il venait d'etre préparé quelle que soit l' époque à l' aquelle on l' ouvrira.

Représenté par M. J. T. DENIS ET COMP<sup>IE</sup>, 51, Lime Street, City, Londres.









MR. APPERT, RUE DES TROIS BORNES, PARIS.

Mr. Appert's method of preserving a Sheep entire, consists in depriving it first of its Bones, after which it is skinned and stuffed in order to preserve its natural size. It is then put into a Tin Case Box. Hitherto it had been found impossible to preserve an animal of this size entire, and if ever done, never without depriving it of the delicacy of flavor.

In fact, in order to preserve an alimentary substance, according to Mr. A's. method it must be put into a vessel, which is again put into another well closed vessel filled with water, and kept boiling on the fire, and the time of its remaining there must be in proportion to the size of the animal to be preserved, for the preservation of the flavor of the substance submitted to this operation depends chiefly upon the proper time being observed for the absorption of the Oxygen.

It is by means of the apparatus invented by Mr. A. (the excellence of which 2 years of application and use fully attest) that the preservation of an entire Sheep has been rendered possible in a short time, and preserving all the delicacy of the animal even when opened years after its having been prepared.

Represented by M. J. T. DENIS, & Co., 51, Lime Street, City, London.

# Universal Exhibition

Exhibition  
1849.

of London

MEDAL  
of honour

## CHOCOLATE CHOQUART

259, rue St<sup>e</sup> Honoré and N<sup>o</sup> 8, rue St<sup>e</sup> Nicaise Paris.

My chocolate having been approved by the Jury of commerce of the Seine, and the Central Jury, for its admission to the universal Exhibition of London. Its superiority can no longer be called in question.

Henceforth the chocolate Choquart is reckoned as good, and may take rank with the first houses in Paris for its quality and improvement.

The public has already been able to appraise its perfection, fabrication, and cheapness of price, at the exhibition that took place in 1849 in Paris.

The cheapness of my chocolate is due to the particular care I have taken for its composition and perfection by a new system of Corréfaction.

### Price of the different qualities of my chocolate:

|                                                                    |                                                             |
|--------------------------------------------------------------------|-------------------------------------------------------------|
| 1 <sup>st</sup> Superior quality pure Carrack.                     | 4 <sup>th</sup> Quality, 1 pound ... 1 <sup>£</sup> 5 pence |
| with Vanilla, 1 pound - 3 <sup>£</sup> "                           | 5 <sup>th</sup> Quality, 1 pound, .. 1 <sup>£</sup> 2 pence |
| 2 <sup>d</sup> Superfine Vanilla, 1 pound - 2 <sup>£</sup> 5 pence | 6 <sup>th</sup> Quality, 1 pound - 1 <sup>£</sup> "         |
| 3 <sup>d</sup> Superfine 1/2 Vanilla, 1 pound - 2 <sup>£</sup> "   |                                                             |

The grand Central Jury having reckoned its superiority by its admission to the universal Exhibition - I leave it to the public to judge, taste, and experiment it.



Exposition  
1849.

Exposition  
Universelle de Londres.

MÉDAILLE  
d'honneur.

## CHOCOLAT CHOQUART,

259, Rue St. Honoré - et 8, Rue St. Nicaise - Paris.

D'après les nouveaux examens que mon Chocolat vient de subir, par le Jury de la Seine, et le Jury Central, pour son admission à l'Exposition universelle de Londres, sa supériorité ne peut plus être contestée.

Aujourd'hui, le Chocolat Choquart, est placé au rang des premières Aisances de l'Europe, par sa qualité supérieure et son perfectionnement. Déjà, à l'Exposition 1849, il fut apprécié du public, pour le fini de son travail et pour la modicité de son Prix. Cette réduction de prix n'est due qu'aux soins particuliers apportés dans sa fabrication, par un nouveau système de Corréfaction, de Préparation et de composition.

### Prix des différentes qualités :

|                                                                       |                             |                 |
|-----------------------------------------------------------------------|-----------------------------|-----------------|
| Jurchoix de Caraque à la Vanille. <sup>1/2 kg</sup> 3 <sup>fr</sup> . | de Santé fin                | le 1/2 kg 1. 50 |
| de Santé Superfin                                                     | de Santé                    | 1. 20           |
| de Santé Superfin, 1/2 Vanille                                        | de Santé, ord <sup>re</sup> | 1. "            |

Le grand Jury Central a prononcé sa supériorité en l'admettant à l'Exposition Universelle. Aujourd'hui, c'est au public à essayer et à juger.

# UNIVERSAL EXHIBITION <sup>OF</sup> 1851.

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**JOSEPH COLIN,**

**9, RUE DES SALORGES, NANTES.**

**PRESERVER OF GAME, FRESH MEATS, VEGETABLES, FRUITS,  
&c. &c.**

---

This Establishment, one of the oldest in France, has long enjoyed the highest celebrity throughout Europe and the Colonies for the exquisite quality of its productions, never surpassed by any other Manufacturer. Admitted to the Parisian Exhibitions, the Proprietors have been honored, for the delicacy of their preparations, with the award of a Golden Medal, in the year 1839.

Induced, by increasing demands from the British Possessions, the Proprietors established a London Dépôt, in the year 1840: their success, during the Eleven past years, encourages them in the present introduction of their produce to the notice and comparison of a discerning public, and especially to those parties connected with the Wholesale and Export Trade.

Aided in their efforts by the liberal measures adopted by the British Government during the Premiership of the deeply regretted Sir Robert Peel, they have been enabled to make considerable reductions on such of their Articles as are now admissible without, or on payment of a merely nominal, duty—by which means the most delicious productions of the Garden and of the Orchard may be placed on the table, in seasons when their obtention by artificial means would be either expensive or impossible, and in climes where such productions are exotics, and but for this invaluable art would be entirely unknown.

Visitors to the exhibition are invited to inspect the various Specimens of Alimentary Preserves; and are assured that they fully retain every property, both in external appearance and in flavor.

---

**Sole Agent for England, & the British Possessions,**  
**A. CHAUFFOURIER,**  
**9, Sackville Street, Piccadilly,**  
**LONDON.**

**And in the Exhibition French Department, North Side,**  
*Adjoining the Piano-forte Room. Catalogue No. 1262.*



# UNIVERSAL EXHIBITION

1851.

JOSEPH COLLIS.

G, RUE DES SALORGES, MANTON.  
PRESIDENT OF GARD, FRESH MEATS, VEGETABLES, FRUITS.

No. 60.

The Exhibition, one of the most in France, has long enjoyed the highest celebrity throughout Europe and the Colonies for the extensive display of its products, more numerous by any other Manufacturer. Admitted to the Exhibition, the Expositors have been honored for the delivery of their proceedings, with the award of a Golden Medal, in the year 1850.

Induced by numerous demands from the British Government, the Expositors established a London Depot, in the year 1848, and received during the London Exposition, numerous orders in the general introduction of their products to the market and consumption of a numerous public, and especially to those persons connected with the Wholesale and Export Trade.

Added to their efforts by the liberal treatment extended by the British Government during the Exposition of the highly respected Sir Robert Peel, they have been enabled to make considerable reductions on such of their articles as are not absolutely essential, or on portions of a costly material, which would be the most delicious productions of the Garden and of the Orchard may be placed on the table, in seasons when their selection by individual persons would be either expensive or impossible, and in climates where such productions are scarce, and but for this favorable aid would be entirely unknown.

Thanks to the exhibition, we intend to improve the various specimens of Agriculture, Horticulture, and the several arts that they fully reveal every object, both in natural appearance and in flavor.

Sole Agent for England & the British Possessions,  
**A. CHAUFOURIER,**  
9, St. Mark's Street, Piccadilly,  
LONDON.

and in the Exhibition French Department, North Side,  
opposite the Music-Hall Room. Catalogue No. 1202.

# DEWAR'S BROWN DURHAM MUSTARD.

The Analytical Sanitary Commission reports "the whole of the forty-two samples of Mustard purchased in various parts of London were adulterated."—*See Lancet of March 22nd, 1851.*

The *Lancet* of June 14th reports of Dewar's Brown Mustard, that it "consists entirely of Mustard, and is therefore perfectly genuine."

From Mons. A. SOYER, Author of the "Gastronomic Regenerator."

"I have, with several friends at the Club, fairly tried your Mustard, and we pronounced the quality superior to any other, as regards purity, flavour, and strength." "A. SOYER."

"Reform Club, Pall Mall, "Oct. 20, 1846."

"I have, at one time and another, examined more than fifty samples of Mustard Flour, and this is the only one in which I did not detect the presence of wheat flour or starch."

"DOUGLAS MACLAGAN, M.D., F.R.S.E.,

"Edinburgh, May 8, 1846." "Lecturer on *Materia Medica*."

"I hereby certify that I have analyzed Dewar's Brown Durham Mustard. I find it quite free from impurity or adulteration of any kind. It possesses strength and pungency in a high degree, has a very agreeable flavour, and is in excellent condition for table use."

"GEORGE WILSON, M.D.,

"Lecturer on *Chemistry*."

"Edinburgh Laboratory, 24, Brown Square,

"August 5, 1846."

LONDON:—Wholesale Agents, E. LAZENBY & SON, 6, Edward Street, Portman Square; and may be had of Messrs. GRIGNON, Suffolk Street, Pall Mall; NEIGHBOUR & SON, 137, High Holborn; GRAHAM, 37, Ludgate Hill; and of the Principal Grocers, Chemists, and Italian Warehousemen in the United Kingdom.

In Jars or Packets, 1s. each; extra size, 2s.

The Mustard should be mixed with water which has been boiled and allowed to cool; hot water destroys its essential properties, and raw cold water might cause it to ferment.

MANUFACTORY, NEWCASTLE-ON-TYNE.

## FOR PUDDINGS, PIES, &c., &c.

G. STUART, Printer, 38, Rupert Street, Haymarket



Fa  
Petite-Ru  
Fa

Le premier  
peu par sa f  
l'Amérique  
considérable  
des cacao q  
livres de ca  
laquelle il  
quantité, su  
végétaux qu  
principale l  
résultat inc  
rien a désir  
tritives. —



A. CHATFIELD  
9, Gackville Street, Piccadilly  
LONDON.

And in the Exhibition French Republic

52

# HENRY EDWARDS'

## HIGHLY-ESTEEMED

# Custard Powder,

*(With Directions.)*

**To make Custards without Eggs.**

From one pint of new Milk take two spoonfulls to moisten the powder; boil the remaining Milk with two ounces of Loaf sugar, and while boiling pour it into a bason, and be sure to stir it quickly, until thoroughly mixed, and when prepared as above, if baked, they are delicious.

The only Custard Powder now before the Public. that is free from the objectionable Greenish Yellow when made.

**TWO-PENNY PACKET FOR A PINT.**

PREPARED BY

**HENRY EDWARDS,**

**2, Gt. Windmill St. Haymarket,**

**LONDON.**

**And 58, CHATHAM STREET,**

**NEW YORK, AMERICA.**

and sold by all Wholesale Chemists, Druggists, and Grocers in London, and on the Continent.

**IN PACKETS, ~~6d.~~, ~~1s.~~, ~~2s.~~, AND BOXES, ~~6d.~~, ~~1s.~~, ~~2s.~~**

*The Sole Inventor of the*

## EGG POWDER,

**FOR PUDDINGS, PIES, &c., &c.**

**G. STUART, Printer, 38, Rupert Street, Haymarket**



**Fa**  
**Petit-lu**  
**Fa**

Le premier  
peu par sa f  
l'Amérique  
considérable  
des cacaos q  
livres de cac  
laquelle il  
quantité, su  
végétaux qu  
principale t  
résultat in  
rien a désir  
trilives. —



# HENRY EDWARDS, MUSTARD POWDER, (This Preparation)

The most perfect Mustard without Eggs.

Two and a half of new Milk take two spoonfuls to measure the  
 Mustard; add the remaining Milk with two ounces of hot  
 water, and when boiled pour it into a basin, and be sure to  
 stir it constantly with a wooden spoon, and when prepared as  
 above it will last an indefinite time.

For only Mustard Powder now before the Public, that is free  
 from the objectionable Greenish Yellow which many

TWO-Penny Packet for a Pint.

PREPARED BY  
 HENRY EDWARDS,  
 61, Windmill St. Haymarket,  
 LONDON.  
 AND 58, CHATHAM STREET,  
 NEW YORK, AMERICA.

And of the Vandyke Chemical, Dyeing, and Glass in  
 London, and on the Continent.  
 PATENTS, TRADE-MARKS, AND BOXES, &c.

The only Preparation of  
**EGG POWDER,**  
 FOR PUDDING, PIES, &c.

PREPARED BY HENRY EDWARDS, 61, WINDMILL ST. HAYMARKET, LONDON.

LONDON.  
 And in the Exhibition French Department, North Side,  
 opposite the Picture Gallery. Catalogue No. 1021.





**Expositi on**  
1839-1844 el 1849.

1839. 1844 et 1849.

1839. 1844 et 1849.

1839. 1844 et 1849.

1839. 1844 et 1849.

1839. 1844 et 1849.

| THÉS VERTS.                                              | g. | Pris des 500 l. |
|----------------------------------------------------------|----|-----------------|
| Junior, fin. . . . .                                     | 7  | fr.             |
| Skin, fin. . . . .                                       | 5  | 5               |
| Chulan extra-supérieur. . . . .                          | 16 | 12              |
| Id. supérieur. . . . .                                   | 12 | 10 et           |
| Impérial extra supérieur. . . . .                        | 14 | 12              |
| Id. perlé surfin. . . . .                                | 16 | 10 et           |
| Poudre à canon extra-supérieure.                         | 14 | 16              |
| Id. Gampowder supérieur.                                 | 12 | 14              |
| Id. fin. . . . .                                         | 6  | 12              |
| Tonkay . . . . .                                         |    | 6               |
| Mélanges de trois sortes de Thés,<br>à 8, 10 et. . . . . |    | 12              |

destiné à cet usage à seule fin d'avoir le véritable parfum du thé. — La combinaison dans le mélange de plusieurs sortes de thés est également très-précieuse ; ainsi nous avons recherché les sortes qui s'harmonisaient le mieux pour pouvoir garantir aux amateurs le mélange que nous leur offrons. — Le Thé noir est un thé très-doux ; il convient généralement à tous les tempéramens ; il donne même du ton à l'estomac ; son parfum est des plus agréables. — Le Thé vert étant très-acide, s'emploie dans les digestions laborieuses ; on s'en sert également pour se débarrasser et liquorer. Le mélange de deux tiers de noir et un tiers de vert constitue ce que l'on appelle *Thé d'amateurs*.

destiné à cet usage à seule fin d'avoir le véritable parfum du thé. — La combinaison de ces deux sortes de thés est également très-précieuse ; ainsi son dans le mélange de plusieurs sortes de thés est le mieux pour pouvoir garantir nous avons recherché les sortes qui s'harmonisaient le mieux pour pouvoir garantir aux amateurs le mélange que nous leur offrons. — Le Thé noir est un thé très-doux ; il convient généralement à tous les tempéraments ; il donne même du ton à l'estomac ; son parfum est des plus agréables. — Le Thé vert étant très-acide, s'emploie dans les digestions laborieuses ; on s'en sert également pour se rafraîchir et liquer. Le mélange de deux tiers de noir et un tiers de vert constitue ce que l'on appelle Thé d'amateurs.

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|                  |    |
|------------------|----|
| Prix des 50 déc. | c. |
| fr. 4            | »  |
| 3                | »  |
| 2                | 50 |
| 2                | »  |
| 4                | 50 |
| 3                | »  |
| 5                | »  |
| 3                | »  |

| CHOCOLATS COMPOSÉS. |                                          | Prix des 50 de |    |
|---------------------|------------------------------------------|----------------|----|
|                     |                                          | fr.            | c. |
| Chocolat Vanille    | No 1. au cacao soennouso.                | 5              | 5  |
| Id.                 | No 2. au cacao pur caraque.              | 4              | 4  |
| Id.                 | No 3. au cacao et maragnan.              | 3              | 3  |
| Id.                 | No 4. au 1/4 caraque et maragnan.        | 2              | 2  |
| Id.                 | au salep de Perse, tonique.              | 4              | 4  |
| Id.                 | au sapota et au sagou pectoral.          | 4              | 4  |
| Id.                 | au tapioca et au sagou pectoral.         | 6              | 6  |
| Id.                 | au ter réduit par l'hydrogène.           | 4              | 4  |
| Id.                 | au lait d'amandes douces, pectoral.      | 4              | 4  |
| Id.                 | à la gomme, à l'arrow-root et au lichen. | 4              | 4  |

| CHOCOLATS COMPOSÉS. |                                          | Prix des 50 de |    |
|---------------------|------------------------------------------|----------------|----|
|                     |                                          | fr.            | c. |
| Chocolat Vanille    | No 1. au cacao soennouso.                | 5              | 5  |
| Id.                 | No 2. au cacao pur caraque.              | 4              | 4  |
| Id.                 | No 3. au cacao et maragnan.              | 3              | 3  |
| Id.                 | No 4. au 1/4 caraque et maragnan.        | 2              | 2  |
| Id.                 | au salep de Perse, tonique.              | 4              | 4  |
| Id.                 | au sapota et au sagou pectoral.          | 4              | 4  |
| Id.                 | au tapioca et au sagou pectoral.         | 6              | 6  |
| Id.                 | au ter réduit par l'hydrogène.           | 4              | 4  |
| Id.                 | au lait d'amandes douces, pectoral.      | 4              | 4  |
| Id.                 | à la gomme, à l'arrow-root et au lichen. | 4              | 4  |

|                                                    |         |
|----------------------------------------------------|---------|
| <b>FANTAISIE.</b>                                  |         |
| Chocolat aux pistaches candies. . . . .            | 6       |
| Id. diablotins, vanille . . . . .                  | 5       |
| Id. diablotins, nompaille. . . . .                 | 3       |
| Papillotes . . . . .                               | 5       |
|                                                    | 3, 4 et |
| <b>PASTILLES.</b>                                  |         |
| Pastilles à la vanille N° 1. extra-fines . . . . . | 6       |
| Id. id. N° 2. surfine. . . . .                     | 5       |
| Id. id. N° 3. fine. . . . .                        | 4       |
| Id. id. N° 4. id. . . . .                          | 3       |

|                                                    |         |
|----------------------------------------------------|---------|
| <b>FANTAISIE.</b>                                  |         |
| Chocolat aux pistaches candies. . . . .            | 6       |
| Id. diablotins, vanille . . . . .                  | 5       |
| Id. diablotins, nompaille. . . . .                 | 3       |
| Papillotes . . . . .                               | 5       |
|                                                    | 3, 4 et |
| <b>PASTILLES.</b>                                  |         |
| Pastilles à la vanille N° 1. extra-fines . . . . . | 6       |
| Id. id. N° 2. surfine. . . . .                     | 5       |
| Id. id. N° 3. fine. . . . .                        | 4       |
| Id. id. N° 4. id. . . . .                          | 3       |

**LE NOUVEAU CHOCOLAT.** — On ne saurait trop recommander au public les chocolats que l'Etat a fait fabriquer par le service des Monnaies, car ces chocolats sont naturels et sains. Ils ont été préparés avec le cacao le plus pur, et ne contiennent aucun sucre raffiné. Ils sont donc très sains et très agréables. Ils sont d'ailleurs très économiques, car ils sont vendus à un prix très bas. Ils sont donc très recommandables à tous les points de vue. Ils sont donc très recommandables à tous les points de vue.



1992

# PÂTES ET FARINES

## POTAGES DE CHOCOLAT

POUR

Les substances ordonnées aux malades sont purifiées selon les prescriptions de MM. les médecins. Sur les paquets sont indiquées leurs propriétés hygiéniques et la manière de les préparer. — Toutes les marchandises sont garanties pour leur qualité et leur origine. Les farines ordonnées pour la santé sont moulues fraîches et à mesure de leur emploi.

### RÉSUMÉ DE NOS ARTICLES.

#### Substances et Produits français.

##### FARINES DE LÉGUMES CUITES.

|                         | PRIX<br>le<br>4 1/2 KILOG. |
|-------------------------|----------------------------|
| Farine de Pois.         | 60                         |
| Id. de lentilles.       | 60                         |
| Id. de haricots blancs. | 60                         |
| Id. de haricots rouges. | 60                         |
| Id. de petits pois.     | 1                          |
| Id. de fèves de Marais. | 1                          |
| Racines potagères.      | 1                          |

##### FARINES DE CHATAIGNES CUITES.

|                        |   |
|------------------------|---|
| Farines de châtaignes. | 1 |
| Id. à la vanille.      | 2 |
| Id. au cacao.          | 2 |

##### PÂTES D'AUVERGNE.

|                                 |    |
|---------------------------------|----|
| Macaroni.                       | 60 |
| Vermicelle.                     | 60 |
| Petites pâtes de toutes formes. | 60 |
| Semoule de pâte.                | 60 |
| Semoule de blé.                 | 60 |

##### PÂTES D'ALSACE.

|           |    |
|-----------|----|
| Nouilles. | 80 |
|-----------|----|

##### POLENTA DE POMMES DE TERRE.

|                                         |    |
|-----------------------------------------|----|
| Semoule de pommes de terre pour potage. | 60 |
| Id. chapelure.                          | 60 |
| Farine de pommes de terre pour potage.  | 60 |
| Id. sauce rousée.                       | 60 |

##### PÂTES FÉCULENTES A LA GOMME.

|                                        |    |
|----------------------------------------|----|
| Tapioca français.                      | 80 |
| Id. cristallisé et fleur.              | 80 |
| Sagou français.                        | 70 |
| Petit sagou et mignonnette de sagou.   | 70 |
| Semoule et fleur de sagou.             | 70 |
| Riz français 1 <sup>re</sup> grosseur. | 80 |
| Id. 2 <sup>e</sup> id.                 | 80 |
| Id. 3 <sup>e</sup> id.                 | 80 |
| Arrow-root français.                   | 80 |
| Sagou pectoral perfectionné.           | 2  |
| Salép français.                        | 2  |

##### ARTICLES DIVERS.

|                                     |    |
|-------------------------------------|----|
| Fécule de pommes de terre purifiée. | 50 |
| Id.                                 | 40 |
| Farine de maïs.                     | 40 |
| Farine de sarrasin.                 | 40 |
| Semoule id.                         | 40 |
| Millet décortiqué.                  | 70 |
| Farine de millet.                   | 50 |
| Crème de gruau d'avoine.            | 1  |
| Farine id.                          | 1  |
| Gruau mondé entier.                 | 1  |
| Id. id. cassé.                      | 60 |

Toutes nos Pâtes étant préparées avec le plus grand soin, et exemptes de tous corps étrangers à leur nature, soit pour en altérer la qualité ou en diminuer le prix, nous prévenons les Consommateurs de n'ajouter foi qu'aux paquets qui portent l'adresse de M. FEYEU, rue Taranne, n° 10, à Paris.

#### Substances et Produits étrangers.

##### PÂTES DES ILES, EN PAQUETS.

|                                              | PRIX<br>le<br>1/2 KILOG. |
|----------------------------------------------|--------------------------|
| Tapioca du Brésil, pulvérisé (semoule fine). | 1                        |
| Id. fin.                                     | 75                       |
| Id. préparé (semoule grosse).                | 1                        |
| Id. préparé (petits grains).                 | 60                       |
| Crème de Tapioca pour pâtisserie légère.     | 1                        |
| Sagou des Indes pulvérisé.                   | 2                        |
| Id.                                          | 90                       |
| Salép de Perse pulvérisé.                    | 1                        |
| Id. préparé.                                 | 50                       |
| Arrow-root purifié de la Jamaïque.           | 8                        |
| Fécule de palmier de l'Inde.                 | 5                        |
|                                              | 3                        |

##### PÂTES D'ITALIE.

|                                   |    |
|-----------------------------------|----|
| Macaroni de toutes grosseurs.     | 90 |
| Petite pâte sous diverses formes. | 90 |
| Vermicelle.                       | 90 |
| Nouilles.                         | 90 |
| Lazagnes.                         | 90 |
| Colas de Céleri et bec de plumes. | 90 |
| Semoule de blé.                   | 90 |

##### RIZ.

|                           |    |
|---------------------------|----|
| Crème de riz Caroline.    | 1  |
| Fleur id.                 | 80 |
| Semoule id.               | 70 |
| Julienne au riz.          | 80 |
| Riz de la Caroline, trié. | 45 |

##### ORGES.

|                                 |    |
|---------------------------------|----|
| Orge de Hollande.               | 60 |
| Semoule d'orge.                 | 1  |
| Farine d'orge.                  | 1  |
| Orge d'Allemagne ou petit orge. | 1  |

##### MAIS.

|                             |    |
|-----------------------------|----|
| Semoule de maïs du Piémont. | 70 |
| Farine id.                  | 50 |

##### ARTICLES DIVERS.

|                                     |   |
|-------------------------------------|---|
| Cacao pulvérisé.                    | 3 |
| Racahout, le flacon.                | 2 |
| Café châtaignes.                    | 1 |
| Café glands d'Espagne.              | 1 |
| Farine de glands doux d'Espagne.    | 1 |
| Arrow de la Jamaïque en vrac.       | 2 |
| Id. de l'Inde.                      | 4 |
| Farine de Manioc en nature.         | 3 |
| Sagou de l'Inde, tel qu'il arrive.  | 1 |
| Tapioca en sorte, tel qu'il arrive. | 1 |

##### BISCOTTES DE BRUXELLES.

|                                                                 |   |
|-----------------------------------------------------------------|---|
| La boîte de 3 k <sup>os</sup> 25 à 3 k <sup>os</sup> 50, 12 fr. | 1 |
|-----------------------------------------------------------------|---|

##### NOUVEAUX POTAGES.

|                     |    |
|---------------------|----|
| Gluten granulé.     | 50 |
| Semoule d'épeautre. | 60 |
| Tapioca au cacao.   | 2  |



# SENIORITY LIST

MEMBERSHIP: 2007 2008 2009 2010 2011

SUMMER OF RIVERMOUTH CLUB

18

# PRODUITS ALIMENTAIRES

DE  
**FEYEU,**

Négociant,

RUE TARANNE, 10, A PARIS.

---

## FABRIQUE DE CHOCOLATS

*Par procédé de torréfaction sans le contact direct du feu et à l'air libre.*

SPÉCIALITÉ

DE

## CHOCOLAT TONIQUE FERRUGINEUX.

---

Le fer est un des plus précieux toniques ; employé sous toutes les formes dès la plus haute antiquité, il est un des produits chimiques dont la juste réputation n'a fait que grandir. Destiné à renouveler les éléments constituants du sang, il ne manque jamais à sa mission, pourvu qu'il soit convenablement administré.

Il faudrait n'avoir pas examiné de malades pour ignorer les merveilles du fer dans la *chlorose*, dans cette terrible maladie connue sous le nom de *pâles couleurs* ; les enfants décolorés, faibles, affectés de palpitation au moindre mouvement violent, n'ont plus qu'une énergie fébrile, ils tombent après le plus petit effort ; et si la maladie est inconnue, on les voit s'infiltrer, s'étioler et mourir avant le temps.

La maladie reconnue, le fer se présente comme le remède infailible pour combattre les accidents. Il est encore très-utile dans toutes les convalescences des maladies graves qui ont altéré la constitution, à la suite des fièvres typhoïdes, des maladies éruptives, des pertes utérines ou séminales, etc.

Il reste à déterminer sous quelle forme il devra être administré.

Le fer, *réduit par l'hydrogène*, qui n'est autre que le fer à l'état de pureté parfaite et ramené à son plus grand degré d'atténuation et de division, est, sans contredit, de toutes les préparations ferrugineuses la plus facile à administrer. Il est sous cette forme en poudre impalpable, inodore et sans goût ; et il trouve dans l'estomac des acides naturels qui forment avec lui, immédiatement, des composés salins qui facilitent son absorption et sa dispersion dans toute l'économie. Suivant l'âge, il devra être administré de 20 centigrammes chez un enfant de deux ans, à deux grammes et plus chez un adulte. Suivant l'effet obtenu, on pourra sans aucun danger augmenter ces doses d'un tiers et les porter à 30 centigrammes chez l'enfant et à trois grammes chez l'adulte.

On a longtemps cherché à mélanger le fer avec des substances alimentaires, avec le pain, avec le sucre, sans arriver

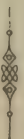


à son but. Il suffit souvent que les enfants sachent que leur pain est devenu un médicament pour qu'ils le refusent ; le chocolat, au contraire, a pour eux, en général, un attrait irrésistible. Bien préparé, comme celui que nous avons l'honneur de vous offrir (il ne subit pas de contraction d'oxyde qui nuirait à ses propriétés, ainsi qu'il peut arriver s'il est mis en contact avec un produit contenant des matières humides), en outre, il devient un bonbon fort agréable.

Nous avons eu soin de mettre dans chaque pastille une quantité de fer telle que la couleur et le goût du chocolat ne sont nullement changés à l'œil le plus exercé comme au palais le plus délicat.

Il sera toujours facile de faire désirer et prendre à un jeune enfant une ou deux pastilles dans la journée ; et la jeune fille chlorotique, qui répugnerait à prendre trois cuillerées de sirop avec le goût d'encre, ou six pilules plus ou moins volumineuses, ne se fera jamais prier pour ranger dans la journée dix ou quinze pastilles, qui seront pour elle une friandise plutôt qu'une chose désagréable.

Il sera toujours préférable de manger ce chocolat sec, soit en pastilles ou tablettes, jamais le faire fondre dans un liquide quelconque ; c'est en lui conservant toute sa propriété que l'estomac en aura le profit.



## DOSES.

Pour un enfant de deux ans une pastille en deux fois dans la journée. Au bout d'un mois, il pourra en prendre une et demie ou deux.

Pour un adulte, huit à dix pastilles par jour et augmenter graduellement jusqu'à quinze ; ou bien, une tablette de la division de douze à la livre et graduellement augmenter jusqu'à une tablette et demie.

*Pour éviter toute contrefaçon chaque boîte sera revêtue d'une bande portant l'adresse et signée*

NOTA. Tous les Chocolats de santé fabriqués par M. FEYERX sont garantis sans aucune espèce d'arômes, par conséquent ils peuvent convenir à tous les estomacs. Ils conviennent également dans tous les régimes ordonnés, puisqu'ils sont naturels et sans aucune espèce de corps étrangers.



DE SUBSTANCES ET PRODUITS ALIMENTAIRES FRANÇAIS,  
Préparation de Produits étrangers hygiéniques



DE  
**FEYEU,**  
Négociant

A PARIS, RUE TARANNE, N° 10.

Fabrique

Petite-Rue-Taranne, n. 9.



Exposition.  
1839, 1844 et 1849.

**PRIX COURANT AU COMMERCE.**

**CHOCOLATS DE SANTÉ.**

| Chocolats de Santé; | n° 1. | n° 2. | n° 3. | n° 4. | n° 5. | n° 6. |
|---------------------|-------|-------|-------|-------|-------|-------|
| —                   | 500   | 450   | 400   | 350   | 300   | 240   |
| —                   | 500   | 450   | 400   | 350   | 300   | 240   |
| —                   | 500   | 450   | 400   | 350   | 300   | 240   |
| —                   | 500   | 450   | 400   | 350   | 300   | 240   |
| —                   | 500   | 450   | 400   | 350   | 300   | 240   |

Prix des 100 k.

**CHOCOLATS HYGIÉNIQUES.**

|                                                 |     |
|-------------------------------------------------|-----|
| Chocolat composé au fer réduit par l'hydrogène. | 500 |
| — au lait d'amandes.                            | 500 |
| — au salep de Perse.                            | 500 |
| — au lichen.                                    | 500 |
| — à la châtaigne.                               | 500 |
| — aux glands doux, etc., etc.                   | 500 |

Prix des 100 k.

Les Chocolats à la vanille sont cotés 4 franc de plus par kilog.; tous sont préparés pour une longue conservation sans altération de qualité pour l'exportation.

**SUBSTANCES ET PRODUITS FRANÇAIS.**

**FARINES DE LÉGUMES CUITES.**

| Farine | de pois. | de lentilles. | de haricots blancs. | de haricots rouges. | de petits pois. | de fèves de marais. | de racines potagères. |
|--------|----------|---------------|---------------------|---------------------|-----------------|---------------------|-----------------------|
| —      | 90       | 90            | 90                  | 90                  | 160             | 200                 | 280                   |
| —      | 90       | 90            | 90                  | 90                  | 160             | 200                 | 280                   |
| —      | 90       | 90            | 90                  | 90                  | 160             | 200                 | 280                   |
| —      | 90       | 90            | 90                  | 90                  | 160             | 200                 | 280                   |

Prix marchand.  
LES 100 K.

**PÂTES FÉCULENTES A LA GOMME.**

|                                            |     |
|--------------------------------------------|-----|
| Tapioca français en paquets.               | 120 |
| — cristallisé et fleur.                    | 120 |
| Sagou français.                            | 110 |
| Petit sagou et mignonnette de sagou franç. | 110 |
| Semoule et fleur de sagou français.        | 110 |
| Riz français, trois grosseurs.             | 120 |
| Arrow-Root français en paquets.            | 130 |
| Salép français                             | 400 |
| Sagou pectoral perfectionné.               | 140 |

Prix marchand.  
LES 100 K.

**SUBSTANCES ET PRODUITS ÉTRANGERS.**

|                                            |      |
|--------------------------------------------|------|
| Tapioca du Brésil pulvérisé, semoule fine. | 250  |
| — fin (semoule grosse).                    | 240  |
| — préparé (petits grains).                 | 220  |
| Crème de Tapioca pour pâtisserie légère.   | 260  |
| Sagou des Indes pulvérisé (semoule fine).  | 280  |
| — préparé en grains perlés.                | 220  |
| Salép de Perse pulvérisé.                  | 1050 |
| Arrow-Root purifié de la Jamaïque.         | 650  |
| Fécule de Palmier de l'Inde.               | 500  |

Prix marchand.  
LES 100 K.

**FARINES DE CHATAIGNES CUITES.**

|                                         |     |
|-----------------------------------------|-----|
| Farine de châtaignes cuites pour purée. | 260 |
| — à la vanille.                         | 360 |
| — au cacao.                             | 360 |

**ARTICLES DIVERS.**

|                                                 |     |
|-------------------------------------------------|-----|
| Tapioca au cacao pour déjeuner.                 | 300 |
| Fécule de pommes de terre purifiée, paquets.    | 70  |
| — ordinaire,                                    | 50  |
| Farine de sarazin.                              | 50  |
| Semoule.                                        | 110 |
| Millet décortiqué.                              | 70  |
| Farine de millet.                               | 130 |
| — de gruau d'avoine en paquets.                 | 160 |
| Crème de gruau d'avoine en paquets.             | 240 |
| Gruau mondé, en vrac.                           | 80  |
| Cacao pulvérisé.                                | 400 |
| Racahout (le flacon).                           | 2   |
| Café de glands d'Espagne, en paquets.           | 180 |
| — de châtaignes,                                | 160 |
| Farine de glands doux d'Espagne.                | 400 |
| Sagou de l'Inde, tel qu'il arrive de 140 à 160. | 140 |
| Tapioca en sorte.                               | 170 |
| Farine de maïs.                                 | 60  |

**FARINES DE CHATAIGNES CUITES.**

|                                         |     |
|-----------------------------------------|-----|
| Farine de châtaignes cuites pour purée. | 260 |
| — à la vanille.                         | 360 |
| — au cacao.                             | 360 |

**PÂTES D'AUVERGNE.**

|                                 |    |
|---------------------------------|----|
| Macaroni.                       | 80 |
| Vermicelle.                     | 80 |
| Petites pâtes de toutes formes. | 80 |
| Semoule pâte.                   | 80 |
| Semoule de bié.                 | 80 |

**PÂTES D'ALSACE.**

|           |     |
|-----------|-----|
| Nouilles. | 110 |
|-----------|-----|

**POLENTA DE POMMES DE TERRE.**

|                                             |    |
|---------------------------------------------|----|
| Semoule de pommes de terre p. potage (paq.) | 90 |
| — chapelure —                               | 90 |
| Farine de pommes de terre p. potage —       | 90 |
| — sauce rousse. —                           | 90 |

**NOUVEAUX POTAGES.**

|                                |     |
|--------------------------------|-----|
| Gluten.                        | 70  |
| Semoule d'épeautre.            | 80  |
| Farine de potiron.             | 600 |
| Pâtes granulées à la julienne. | 100 |
| — au manioc.                   | 80  |
| — à la purée de pois.          | 80  |

**RIZ.**

|                                   |     |
|-----------------------------------|-----|
| Crème de riz Caroline en paquets. | 140 |
| Fleur.                            | 110 |
| Semoule.                          | 110 |
| Julienne au riz.                  | 110 |

**ORGES.**

|                                 |     |
|---------------------------------|-----|
| Orge de Hollande.               | 90  |
| Semoule d'orge.                 | 180 |
| Crème d'orge.                   | 180 |
| Orge d'Allemagne ou petit orge. | 160 |

Sur tous les articles en paquets sont indiquées la propriété et la manière de les préparer.

Les Magasins et Fabriques sont fermés les Fêtes et Dimanches.





# PRICE LIST.

## CHOCOLATE AND COCOA,

MANUFACTURED BY

## J. S. FRY & SONS,

## BRISTOL & LONDON,

Manufacturers by Special Appointment to the Queen.



SEPTEMBER, 1851.

ESTABLISHED 1728.

Paris. — Imprimerie de Wittersheim, 8, rue Montmorency.

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## Chocolates,

In  $\frac{1}{4}$  lb. Cakes.

|                  |                                  | Whole-<br>sale,   | Retail. |
|------------------|----------------------------------|-------------------|---------|
| Plain            | Chocolate                        | per lb.           |         |
| Best Plain       | do.                              | 1 10              | 2 2     |
| Fine Crown       | do.                              | 2 3               | 2 8     |
| Churchman's Milk | do.                              | 2 7               | 3 4     |
| Buff             | do.                              | 3 0               | 4 0     |
| Drab             | do.                              | 1 6               | 1 10    |
| Drab and Pink    | do.                              | 1 2               | 1 6     |
| Spanish          | do.                              | 0 11              | 1 2     |
| Naked            | do.                              |                   |         |
| Trinidad         | do. (same quality as the 1d.)    | 0 8 $\frac{1}{2}$ |         |
|                  | Cakes below)                     | 0 11              | 1 4     |
| Superfine        | do. in 4oz. bars, plain or sweet | 1 6               |         |

## Chocolates,

In 1d. Cakes.

|                                                                                          |      |     |
|------------------------------------------------------------------------------------------|------|-----|
| Small Cakes, (17 in the lb. and 17 in 2lb.) per lb.)                                     | 0 10 | 1 4 |
| Trinidad Chocolate, in 1 oz. Cakes, moulded }<br>and lettered, (packed in 14lb. boxes) } | 0 11 | 1 4 |
| Soluble Chocolate, 1oz. cakes (packed in 6lb. )<br>boxes and 1lb. packets)..... }        | 0 10 | 1 4 |

## French Chocolates,

|                                                                                                             |      |                            |
|-------------------------------------------------------------------------------------------------------------|------|----------------------------|
| Chocolat à la Française, in 1lb. packets and }<br>3lb. boxes, in sticks covered with tin-foil }<br>per lb.) | 1 10 | 3 0                        |
| The same à la Vanille                                                                                       | 1 10 | 3 0                        |
| French Sticks, Vanilla, (in colored tin foil, }<br>in 1 lb. packets, and 3lb. boxes)..... }                 |      |                            |
| in 50 to the lb.                                                                                            | 3 0  |                            |
| in 40 to the lb.                                                                                            | 2 6  |                            |
| French Chocolate in 1oz. cakes, packed in 14lb. }<br>fancy boxes ..... per box }                            | 2 0  |                            |
| Chocolat de Santé, in $\frac{1}{4}$ lb. cakes per lb....                                                    | 1 0  | 1 6                        |
| Ditto ditto $\frac{1}{2}$ lb. Fin                                                                           | 1 6  | 2 0                        |
| Ditto ditto " Superfin                                                                                      | 2 4  | 3 0                        |
| Ditto ditto " Extra Superfin                                                                                | 3 0  | 4 0                        |
| A la Vanille ..... Fin                                                                                      | 2 4  | 3 0                        |
| Ditto ..... Extra Superfin                                                                                  | 3 0  | 4 0                        |
| Queen Victoria's Extra Superfin Carraque                                                                    | 4 0  | 5 0                        |
| Prince Albert's Extra Superfin Carraque, a la }<br>Vanille ..... }                                          | 4 0  | 5 0                        |
| Bonbons, of various kinds                                                                                   |      |                            |
| Chocolate Lozenges, (in $\frac{1}{4}$ lb. boxes) per doz. }<br>boxes. .... }                                | 8 6  | 1 0<br>4 $\frac{1}{2}$ box |

## Cocoas.

|                                                                            | Whole-sale. | Retail |
|----------------------------------------------------------------------------|-------------|--------|
| Fry's Patent Cocoa, in $\frac{1}{4}$ lb. packets .. per lb.                | 1 0         | 1 4    |
| Rock Cocoa .....                                                           | 0 9         | 1 0    |
| Trinidad Rock Cocoa .....                                                  | 70 0        |        |
| Soluble Rock ditto .....                                                   |             |        |
| Rock Cocoa refined, loose, and in $\frac{1}{4}$ lb. packets }<br>per lb. } | 0 10        |        |
| Ground Cocoa .....                                                         | 70 0        |        |
| Nibs, of best quality .....                                                |             |        |
| Ditto, ground in $\frac{1}{4}$ lb. packets .....                           | 84 0        | 1 0    |
| Ditto, ditto in $\frac{1}{4}$ lb packets in 16lb. counter boxes            | 84 0        | 1 0    |
| Roasted Cocoa Nuts, according to quality .....                             |             |        |
| Shells .....                                                               | 0 6         |        |
| Flaked Cocoa, according to quality .....                                   |             |        |

## Articles easy of Solution.

|                                                                                                     |      |     |
|-----------------------------------------------------------------------------------------------------|------|-----|
| Sassafras Chocolate, in $\frac{1}{4}$ lb. canisters .... per lb.                                    | 3 0  | 4 6 |
| Soluble Chocolate, best, in $\frac{1}{4}$ lbs. .... per lb.                                         | 1 3  | 1 6 |
| Ditto ditto in blue do. (or as above in )<br>1oz. cakes) .....                                      | 0 10 |     |
| Chocolate in Powder, in $\frac{1}{4}$ lb. canisters. per lb.                                        | 2 2  | 2 8 |
| Ditto ditto in green do. ....                                                                       | 1 7  | 2 0 |
| Chocolate or Cocoa Paste in $\frac{1}{4}$ lb. pots. ....                                            | 2 2  | 2 8 |
| Ditto ditto, in green do. ....                                                                      | 1 7  | 2 0 |
| Broma in $\frac{1}{4}$ lb. packets. ....                                                            | 2 2  | 2 8 |
| Ditto in green ditto. ....                                                                          | 1 7  | 2 0 |
| Soluble Chocolate Powder, loose and $\frac{1}{4}$ lb. packets                                       | 0 9  | 1 0 |
| Soluble Cocoa, in $\frac{1}{4}$ lb. packets .....                                                   |      |     |
| Ditto ditto, in green with gold label, per cwt.                                                     | 60 0 |     |
| Ditto do. in Hexagon tinfoil packets .....                                                          | 60 0 |     |
| Ditto ditto, in Salmon packets .....                                                                | 60 0 |     |
| The above 3 are packed in counter boxes.                                                            |      |     |
| Ditto ditto, superior .....                                                                         |      |     |
| Ditto ditto, loose .....                                                                            |      |     |
| Ditto ditto, Flaked .....                                                                           |      |     |
| Granulated Cocoa, in 14lb boxes .....                                                               | 1 1  | 1 4 |
| Ditto ditto in $\frac{1}{4}$ lb. packets in boxes ....                                              | 1 1  | 1 4 |
| Homœopathic Cocoa in 1lb, $\frac{1}{2}$ lb, and $\frac{1}{4}$ lb. packets }<br>(in boxes) per lb. } | 1 0  | 1 4 |
| Dietetic Cocoa, in 1lb, $\frac{1}{2}$ lb, and $\frac{1}{4}$ lb. packets }<br>(in boxes) per lb. }   | 1 0  | 1 4 |

## Chicory.

|                                                    |  |
|----------------------------------------------------|--|
| Genuine Hambro' in powder or Nibs .. per cwt.      |  |
| Ditto, English ditto .....                         |  |
| Chicory Powder, in $\frac{1}{4}$ lb. packets ..... |  |

Paris. — Imprimerie de Wittersheim, 8, rue Montmorency.

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# PATES ET FARINES POUR POTAGES



MÉ DAILLE D'ARGENT  
A l'Exposition de 1849.

## GROULT J<sup>NE</sup>

Fabricant à Paris.



USINE A VAPEUR  
A Vitry-sur-Seine.

Dépôt à LONDRES, chez M. CHAUFFOURIER, 9, Sackville street.

### SUBSTANCES ÉTRANGÈRES

(Garanties d'origine.)

Tapioca du Brésil pulvérisé en semoule fine, et vendu sous la désignation de TAPIOCA DE GROULT J<sup>ne</sup>... 4 80

Sagon des Indes, 1<sup>re</sup> sorte, préparé et purifié, vendu sous la désignation de SAGOU DE GROULT J<sup>ne</sup>... 4 50

Arrow-Root de la Jamaïque (des Iles *Dominiques*), préparé et purifié... 3 4

Salep de Perse (Bulbes des Orchis), préparé et pulvérisé... 8 "

Tapioca du Brésil fin, préparé... 1 60  
— grains, préparé... 4 50  
Crème de Tapioca pour croquettes... 4 80  
Tapioca au cacao pour déjeuner... 2 "  
Sagon des Indes pulvérisé en semoule... 4 80  
Fécule de palmier des Indes... 2 "  
Farine de Manioc en nature... 4 "

### DICTAMIA

Pour Déjeuners et Crèmes d'Entremets.

La boîte de 42 déjeuners au cacao... 2 50  
— au café... 2 50  
Chaque boîte est revêtue de la signature de **GROULT J<sup>e</sup>**.

### BISCOTTES DE BRUXELLES

DE F. WAFFELAER, FOURNISSEUR DE LA COUR,  
rue de la Violette, à Bruxelles.

Le demi-kilo... 4 80  
La boîte de 3 k. à 3 k. 25... 42 "  
(On reprend la boîte vide pour 1 fr.)

### RIZ.

Riz de la Caroline, 4<sup>re</sup> qualité, trié... 4 45  
— du Piémont... 4 45  
Semoule de Riz... 4 70  
Farine Fleur de Riz... 4 80  
Crème de Riz... 4 "

Pour éviter les contrefaçons, le Tapioca pulvérisé sera rendu à l'avenir sous la désignation de TAPIOCA DE GROULT J<sup>e</sup>, avec garantie d'origine.

### EXPOSITION DE 1849.

NOUVEAUX PRODUITS.

RIZ-JULIENNE pour potage... le 1/2 kil. # 80

TAPIOCA AU CACAO, déjeuner des convalescents... 2 "

PARMENTINE pour potage... # 60

### FARINES DIVERSES.

FARINES de Racines potagères et de légumes cuits, dites Farines Diverses.

Propres à faire de la purée à la minute.

Farine de Pois... # 60  
— de Lentilles... # 60  
— de Haricots rouges et blancs... # 60  
— de petits Pois... 4 "  
— de Fèves de Marais... 4 20  
— de Racines pour julienne... 4 60  
Pour éviter la contrefaçon, chaque paquet est signé GROULT J<sup>e</sup>, successeur de DIVERSIER.

FARINE de Châtaignes cuites pour potage et purée... 4 50  
La même, à la vanille, pour gâteau et crème d'entremets... 2 "

FARINE de Gruau de Bretagne (avoine). 4 "  
— d'Orge perlé... 4 20  
— de Maïs, 4<sup>re</sup> qualité... # 40  
— de Sarrasin... # 40  
— de Riz (crème de riz)... 4 "  
— de Gruau de blé... # 40

### SEMOULES DIVERSES.

Semoule de Gruau de Bretagne (avoine). 4 "  
— d'Orge perlé... 4 20  
— de Maïs... # 70  
— de Sarrasin... # 70  
— de Riz (de la Caroline)... # 70  
— d'Italie (blé)... # 90  
— de pâtes d'Italie... # 80  
— d'Auvergne (blé)... # 60  
— de Paris (blé)... # 40

Gruau de Bretagne mondé... # 60  
— de Maïs... # 70  
— de Sarrasin... # 70  
Orge perlé de Hollande... # 60  
Petite Orge d'Allemagne pour potage... 4 20

Les substances ordonnées aux malades sont purifiées selon les prescriptions de M.M. les médecins.

### PATES D'ITALIE.

Macaroni de Naples de trois grosseurs... le 1/2 kil. # 90  
Vermicelle de Gènes... # 90  
Lazagnes... # 90  
Nouilles... # 90  
Semoule... # 90  
Petites Pâtes sous diverses formes... # 80  
Semoule de Pâtes... # 80  
Côtes de céleri et becs de plumes... # 90

### PATES D'AUVERGNE.

Macaroni de Clermont... # 60  
Vermicelle et Semoule... # 60  
Petites Pâtes sous diverses formes... # 60

### GLUTEN GRANULÉ,

Nouveau potage de Véron frères, approuvé par l'Académie de médecine. # 60

### PATES FÉCULENTES

DE LA SOLANÉE PARMENTIÈRE.

Sagon français... # 70  
Tapioca français... # 80  
Arrow-Root français... 4 "  
Salep français... 2 50  
Sagon pectoral perfectionné... 4 "  
Fécule de pomme de terre purifiée... # 50  
— ordinaire... # 40  
Polenta Semoule pour chapelure... # 60  
— pour potage... # 60  
Polenta Farine pour potage... # 60  
— pour sauce rousse... # 60

### RIZ CHOCHINA,

Potage adoucissant, mentionné aux expositions 1827 et 1834.

1<sup>re</sup>, 2<sup>e</sup> et 3<sup>e</sup> grosseur... # 80

### ARTICLES DIVERS.

Nouilles d'Alsace... # 80  
Vermicelle de gruau... # 70  
— de Paris... # 40  
Café châtaigne... 4 "  
— gruau... # 80  
— chicorée, 4<sup>re</sup> qualité... # 70

### PRODUITS DE L'ENTREPOT CENTRAL DE FRANCE.

Café de glands doux d'Espagne... 4 20  
Farine de glands doux d'Espagne... 2 50  
Café de châtaigne perfectionné... 4 "

Cette Maison offre toute garantie, tant pour la fraîcheur et la pureté des substances, que par la sûreté de leur origine.






# LAIT CONCENTRÉ.



Procédé de M. JULES MARTIN DE LIGNAC , inventeur  
breveté , fournisseur de la marine nationale  
française depuis 1849.







# PROSPECTUS-ÉTIQUETTE

DES

## **BOTTES DU LAIT CONCENTRÉ,**

**DE M. J. MARTIN DE LIGNAC,**

DEMEURANT AU CHATEAU DE MONTLEVADE, PRÈS GUÉRET  
(CREUSE).

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### **BREVETS**

EXPOSITION NATIONALE  
PARIS  
1849.

**D'INVENTION**

EN FRANCE, EN ANGLETERRE, EN  
BELGIQUE, EN HOLLANDE, ETC.

A  
M. J.  
LIGNAC.

### **LAIT CONCENTRÉ.**

CETTE CONSERVE DE LAIT, LA SEULE ADOPTÉE PAR LA MARINE DE L'ÉTAT  
EN FRANCE ET EN ANGLETERRE, PEUT SERVIR À TOUS LES  
USAGES ORDINAIRES DU LAIT.

POUR OBTENIR DU LAIT, IL SUFFIT DE DÉLAYER UNE PARTIE  
DE LA CONSERVE DANS CINQ FOIS AUTANT D'EAU  
TIÈDE ET DE FAIRE BOUILLIR.

J. DE LIGNAC.

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# Rapport

DU

## Jury central sur les Produits de l'agriculture et de l'industrie de l'Exposition française en 1849.

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Membres du Jury composant la Commission : MM. DUMAS (de l'Institut),

*président*, EBELMEN, PAYEN, PÉLIGOT, J. PERSON,

LOUIS-LUCIEN BONAPARTE, BALARD.

---

M. MARTIN DE LIGNAC, propriétaire, à Montlevade (Creuse), a exposé du lait conservé à l'état pâteux, dans des boîtes de fer-blanc auxquelles il a appliqué le procédé d'Appert. Ces conserves de lait ont fixé, à plusieurs égards, l'attention du jury. Beaucoup d'essais ont été tentés dans le but d'approvisionner la marine de ce précieux aliment ; aucun n'a réussi jusqu'à ce jour. Le procédé de M. de Lignac, qui est simple et rationnel, consiste à évaporer le lait, préalablement sucré, à raison de 75 grammes de sucre par litre de lait. L'épaisseur de la couche de lait ne doit pas dépasser un centimètre ; l'évaporation se fait dans une large bassine chauffée par un bain-marie, dans la-



quelle le liquide est continuellement remué avec une spatule. Quand le lait est arrivé à la consistance de miel, et qu'il a perdu 60 p. 0/0 d'eau environ, on l'enferme dans des boîtes de ferblanc que l'on soude et que l'on soumet à l'ébullition dans un bain-marie. La fermeture de ces boîtes offre un important perfectionnement : elle est faite avec une bande d'étain pur qui réunit le couvercle à la boîte. La mollesse de l'étain permet de les ouvrir très-facilement à l'aide d'un couteau. On sait combien les boîtes ordinaires de ferblanc qui contiennent des produits conservés par la méthode d'Appert sont difficiles et dangereuses à ouvrir, à cause de la nécessité où l'on est de déchirer la feuille de ferblanc qui les compose.

Pour employer cette conserve de lait, il suffit de la délayer dans une quantité d'eau à peu près égale à celle qu'on lui a fait perdre ; en portant le liquide qui offre tous les caractères du lait, qui se recouvre de crème, qui mousse par une ébullition un peu prolongée, et dont le goût et l'odeur sont en tout identiques à ceux du meilleur lait sucré. Ce liquide, une fois refroidi, se conserve plus long-temps que le lait ordinaire, alors même qu'on a pris la précaution de faire bouillir ce dernier.

Les conserves de lait de M. de Lignac ont été expérimentées à Toulon, par l'ordre de M. le ministre de la marine, et le rapport de la commission, composée du premier médecin en chef de la marine, d'un capitaine de frégate et d'un sous-commissaire de la marine, leur est favorable en tous points : cette commission a comparé ce lait aux conserves de lait double qu'on prépare à Nantes, et qui se délivre actuellement, pour le service des malades, à bord des bâtiments. Après un examen prolongé et consciencieux de ces produits, elle arrive à cette conclusion : « En présence de pareils résultats, la commission émet, sans hésiter, l'opinion que la conserve de M. de Lignac, bien supérieure à l'autre, est, sous tous les rapports, appropriée à l'usage auquel on la destine, et peut être considérée, à juste titre, comme un bienfait pour la navigation.... Elle est d'avis qu'il y a lieu de substituer la conserve de M. de Lignac aux produits de cette nature dont la marine a fait usage jusqu'à ce jour. »

D'autres expériences officielles, faites par les officiers de santé en chef de l'hôpital du Dey, à Alger, constatent « que ce lait, consommé sous forme de vermicelle, de riz et de soupe au lait, a fourni des aliments de bonne nature et d'une saveur agréable ; que, tandis que le lait de

» l'Algérie ne peut être soumis à la plus courte ébullition sans tourner,  
» le lait régénéré a souvent bouilli fort long-temps sans éprouver cet ac-  
» cident. »

Enfin, des expériences de même nature ont été faites par beaucoup de capitaines de navires anglais ; elles ont conduit les lords commissaires de l'amirauté à adopter ces préparations pour le service de l'Etat. 45,000 boîtes en ont été livrées à la marine anglaise.

Au point de vue de l'agriculture, le procédé de M. de Lignac employé pour conserver le lait offre un très-grand intérêt. Il aura pour résultat de donner à ce liquide une valeur vénale plus grande, souvent triple ou quadruple de ce qu'elle est aujourd'hui dans les localités éloignées des centres de population ; il placera les fermes des contrées les moins favorisées au niveau des fermes voisines des grandes villes, quant à la vente de leur lait.

Le jury central apprécie toute l'importance de cette découverte ; il accorde à M. de Lignac la médaille d'argent.





Le 15 Mars 1848, le jour de la fête de la Liberté, le peuple de Paris s'est levé et a proclamé la République. Cette révolution a été le point de départ d'une ère nouvelle pour la France.

Le 26 Mars 1848, le peuple de Paris a élu son représentant à l'Assemblée nationale. Ce représentant a été Louis Blanc, un homme de bien et un grand patriote.

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INSTITUT DE FRANCE.  
ACADÉMIE DES SCIENCES.

Extrait des *Comptes rendus des séances de l'Académie des Sciences*, tome XXIX,  
séance du 5 novembre 1849.

RAPPORT

*Sur un Mémoire de M. DE LIGNAC, relatif au produit des vaches  
laitières et à la fabrication des conserves de lait.*

Commissaires : MM. **Duperrey, Balard; Payen**, rapporteur.

« Dans le Mémoire qu'il soumet au jugement de l'Académie, M. de Lignac a pris pour point de départ les travaux qui, dans ces derniers temps, ont eu pour objet la question économique de la production du lait.

« Il résulte de ces travaux qu'au moyen des vaches laitières on peut réaliser, au profit de l'homme, le maximum de substance alimentaire que les herbivores puissent fournir en consommant une ration donnée de fourrages.

« L'auteur cite particulièrement, à cet égard, les expériences de M. Durand, de Caen; il rappelle l'heureuse transformation des cultures de céréales en prairies améliorantes, qui élevèrent la puissance du sol dans le pays de Brai. Dans cette belle contrée de l'ancienne Normandie et d'une partie de la Picardie, où les circonstances locales étaient si favorables à cette transformation, la production du lait fit succéder l'abondance à la misère des populations. C'est à dater de cette époque que les plateaux qui étaient en friche ont pu être mis en culture.

« L'auteur montre que la valeur de la substance brute peut s'augmenter notablement encore et servir à rémunérer un plus grand nombre de travailleurs, lorsque certaines industries, la fabrication des divers fromages et la préparation du beurre, par exemple, diminuent le volume et facilitent la conservation et les transports des produits obtenus.

« C'est une solution de ce genre, plus complète peut-être, et susceptible de

P.



devenir plus générale, que M. de Lignac s'est proposée en essayant de rendre plus économiques et plus sûrs les procédés de la conservation du lait.

« Il a pensé qu'il pourrait ainsi améliorer la condition des agriculteurs qui, en certaines localités, obtiennent à peine 5 centimes par litre de lait, c'est-à-dire la moitié ou le tiers seulement de ce que reçoivent, pour une quantité égale, les nourrisseurs à portée des voies de communications, on en possession d'industries dont le lait constitue la base.

« M. de Lignac, comme agriculteur, se trouvait lui-même dans ces circonstances défavorables lorsqu'il entreprit ses expériences. La terre qu'il cultive est située dans l'une de ces zones mal partagées, où le lait de bonne qualité vaut moins de 10 centimes le litre.

« Il dirigea ses recherches vers les moyens d'assurer la conservation du lait sans lui enlever aucun de ses principes immédiats.

« M. de Lignac connaissait bien alors les travaux de M. Gay-Lussac, de M. Braconnot et d'Appert, qui avaient déjà servi de guide dans la plupart des essais de ce genre.

« Plusieurs modifications du procédé de M. Braconnot avaient fourni des conserves en pâte ou sous forme de tablettes, peu altérables; mais les moyens employés laissaient perdre une partie des principes du lait (lactose, sels et substance azotée solubles), et présentaient trop de complication : on employait l'acide chlorhydrique pour former un coagulum, et le carbonate de soude pour redissoudre le magma épuré.

« Un officier de marine, à Bordeaux, M. de Villeneuve, avait mieux réussi en concentrant, avec de grandes précautions, le lait préalablement sucré; mais ses procédés ne purent être rendus assez manufacturiers pour se soutenir.

« Quelques personnes ont essayé de l'imiter sans approcher du but autant que lui : une partie du beurre se séparait durant la concentration, trop lente et faite dans des vases trop profonds.

« Le procédé d'Appert, appliqué au lait riche en principes solides, obtenu en fractionnant les traites et prenant les dernières parties, donne quelquefois de bons résultats; mais à la longue, et surtout durant les transports, une portion du beurre se sépare du liquide.

« M. Robinet, membre de l'Académie de Médecine, avait, à la vérité, obtenu, dans les meilleures conditions, un sirop de lait de très-bonne qualité; mais c'était une préparation de laboratoire plutôt qu'un produit industriel. Voici comment aujourd'hui M. de Lignac parvient à éviter les inconvénients des autres méthodes :

« La première condition à remplir consiste à se procurer du lait de très-



bonne qualité : on l'obtient depuis le printemps jusqu'à l'automne, pendant les saisons où les vaches restent à l'air dans des prairies fertiles, et dont les plantes sont variées; car il est évident que plusieurs autres alimentations données aux vaches à l'étable durant l'hiver changent la nature du lait. Les navets, les pommes de terre, les choux, en trop fortes proportions, lui communiquent une saveur désagréable; certains tourteaux oléagineux transmettent à la matière grasse du lait des caractères particuliers, et le beurre devient en quelque sorte huileux. On comprend que le procédé de conservation, loin d'amoinrir ces défauts, ne pourrait que les exagérer.

« La quantité de lait à préparer doit être obtenue de traites presque simultanées, afin de le laisser le moins de temps possible exposé aux altérations spontanées. Le vase dans lequel la concentration s'opère est à fond plane, afin que l'épaisseur du liquide y soit faible, égale partout, et ne dépasse point 2 à 3 centimètres.

« La chaleur est communiquée par la vapeur circulant dans une double enveloppe, de façon à ce que la température du lait ne puisse atteindre 100 degrés centésimaux.

« On fait préalablement dissoudre, par litre de lait, 75 à 80 grammes de sucre blanc : c'est à la fois un agent antiseptique et un condiment, presque toujours employé avec le lait dans les préparations alimentaires usuelles.

« Il importe beaucoup de hâter l'évaporation du liquide ainsi sucré : on y parvient en l'agitant sans cesse à l'aide d'une spatule, et l'on empêche ainsi la formation des pellicules qui ne se délayeraient plus ensuite.

« Lorsque le lait est réduit aux 2 dixièmes environ de son volume primitif, on le verse dans des boîtes cylindriques en fer-blanc, de la contenance de 1 litre ou de  $\frac{1}{2}$  litre, que l'on traite suivant la méthode d'Appert.

« M. de Lignac ajoute un perfectionnement notable à la fermeture de ces boîtes, en y soudant une bande en étain que l'on peut couper circulairement de façon à ouvrir la boîte sans la moindre difficulté. Les conserves ainsi préparées, ont déjà reçu la sanction de la pratique en grand; on les a embarquées avec succès parmi les approvisionnements de la marine de France et d'Angleterre.

« Vos Commissaires ont pu les comparer, au retour d'expéditions, avec des conserves dites de lait double; ces dernières avaient toujours laissé séparer en petites agglomérations non délayables, une partie du beurre; parfois elles se détériorent profondément : l'altération du lait, préservé jusque-là, commence toujours d'ailleurs peu de temps après l'ouverture des boîtes.

« Ces inconvénients ne sont pas à craindre relativement aux conserves de M. de Lignac, préparées avec tous les soins convenables.



« Voici les observations que nous avons faites et répétées sur plusieurs échantillons de ces conserves embarquées ou non embarquées, car les différences n'étaient pas sensibles entre elles :

« Elles sont demi-translucides, présentent une consistance pâteuse, et développent l'odeur ordinaire du lait qui a subi une ébullition; elles se délayent facilement dans l'eau tiède, et deviennent alors plus opaques ou laiteuses; lorsque, par l'addition de 4 volumes d'eau de rivière, on a quintuplé leur volume, le liquide obtenu offre la composition moyenne du lait normal: on peut le chauffer à 100 degrés, et faire bouillir ce lait, en quelque sorte régénéré, sans qu'aucune altération s'y manifeste.

« Employé dans les préparations usuelles de thé, de café, de chocolat, il serait difficile de distinguer ces aliments de ceux que l'on confectionne avec le lait ordinaire sucré et bouilli.

« Pendant quinze jours les mêmes essais sur une boîte entamée ont donné des produits analogues; si on laisse, pendant huit ou dix jours, la boîte ouverte sans y rien prendre, la superficie de la substance pâteuse devient jaunâtre, et peut contracter une très-légère odeur rance, mais il suffit d'en enlever une couche de quelque millimètres pour éliminer le peu de substance modifiée.

« On voit que les produits obtenus par le procédé de M. de Lignac offrent les caractères des substances alimentaires susceptibles d'une longue conservation, et applicables surtout aux approvisionnements de la marine.

« Si, comme tout doit le faire présumer, la consommation s'étend davantage, on pourra, sans doute, perfectionner encore ce procédé en y appliquant, par exemple, un agitateur mécanique, et les moyens d'évaporation à basse température dits *dans le vide*.

« La communication de M. de Lignac nous a paru digne d'intérêt, en raison du débouché qu'elle offre aux produits de l'agriculture, elle peut fournir un nouvel exemple de l'utilité des industries annexées aux exploitations rurales, enfin elle est encore intéressante au point de vue de l'alimentation salubre des marins de nos équipages. Vos Commissaires pensent qu'à ces différents titres le Mémoire de M. de Lignac mérite l'approbation de l'Académie: ils ont l'honneur de vous proposer de la lui accorder, et d'adresser ce Rapport à M. le Ministre de la Marine et à M. le Ministre de l'Agriculture et du Commerce. »

Les conclusions de ce Rapport ont été adoptées.

# RAPPORT

*Au sujet d'une conserve de lait*

**PRÉPARÉ PAR UN PROCÉDÉ NOUVEAU.**

Aujourd'hui dix-sept avril mil huit cent quarante-neuf, à une heure de relevée, la Commission nommée par le Préfet maritime et composée de

MM. MONGEAT, premier médecin en chef de la marine, *président*.

LAEDERICH, capitaine de frégate.

ARDEN, sous-commissaire de marine.

s'est réunie, le contrôleur de la marine présent au laboratoire de chimie de l'hôpital principal de la marine, à l'effet, ainsi qu'elle en avait reçu l'ordre, d'examiner la conserve de lait préparé par un procédé dont M. MARTIN DE LIGNAC est l'inventeur, et d'en constater les propriétés et le rendement en lait ordinaire, par comparaison avec le lait double qui se délivre actuellement pour le service des malades à bord des bâtiments.

Les trois boîtes de conserve de M. DE LIGNAC destinées aux épreuves ont été d'abord examinées avec soin. La Commission a reconnu qu'elles étaient bien conditionnées : elle a ensuite pesé séparément chacune d'elles. Le résultat de la pesée est consignée ci-dessous :

|                            | POIDS BRUT<br>constaté le 17 avril. | POIDS NET<br>constaté le 1 <sup>er</sup> mai, la boîte étant restée 15 jours<br>ouverte et exposée à l'air. |         |       |
|----------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------|---------|-------|
|                            |                                     | TARE.                                                                                                       | DÉCHET. | NET.  |
| 1 <sup>re</sup> Boîte..... | 0 kil. 800                          | 0,175                                                                                                       | 0,015   | 0,610 |
| 2 <sup>me</sup> Boîte..... | 0 800                               |                                                                                                             |         |       |
| 3 <sup>me</sup> Boîte..... | 0 795                               |                                                                                                             | 0,800   |       |



Cette opération terminée, la commission a pris une boîte au hasard ; elle l'a fait ouvrir en sa présence, et conformément au 2<sup>me</sup> § de la lettre de M. DE LIGNAC, annexée à la dépêche ministérielle du 14 mars 1849, elle en a extrait 200 grammes de conserve qui ont été étendus de 800 grammes d'eau de fontaine qu'on avait fait chauffer légèrement avant d'y introduire la conserve.

On a placé le mélange sur le feu : au bout de quelques minutes, la conserve qui, à l'état froid, avait la consistance d'une pâte molle ou de miel, a été complètement délayée et a produit un lait blanc, consistant, d'un goût agréable, tout à fait semblable, en un mot, à celui du lait frais, sucré, dont on fait usage à terre.

La Commission a fait ouvrir, en même temps, deux boîtes de lait préparé d'après la méthode ancienne, sur les trois qui lui avaient été remises par le service des subsistances.

Le lait de la première boîte était grumelé et offrait un commencement de décomposition : il a été versé dans une capsule et soumis à l'action du feu. Les grumeaux se sont divisés au bout de cinq minutes, mais sans produire un tout homogène, car la partie bitureuse de ce lait surnageait à la surface du liquide. Ce lait, d'un goût aigre, exhalait une odeur désagréable ; il avait passé à l'état acide, et par cette fermentation la matière caséuse avait été séparée de la partie séreuse. C'est la cause des grumeaux observés. Il y aurait danger à délivrer une pareille substance aux malades.

Le lait contenu dans la deuxième boîte était complètement altéré et hors d'état de pouvoir servir aux expériences de la Commission. Les deux boîtes dont il s'agit portent le nom de M. LÉVESQUE, de Nantes, et ont été achetées à Toulon en février 1849.

La Commission voulant ensuite s'assurer que le lait de M. DE LIGNAC possédait les qualités propres à en assurer la conservation, a remis au sous-commissaire des subsistances la boîte dont on avait extrait les 200 grammes employés pour l'expérience dont il vient d'être parlé. Cette boîte a été aussitôt transportée dans le bureau du commissaire des subsistances pour y rester ouverte et exposée à l'air jusqu'au mardi 24 avril 1849.

Le 24 avril, la boîte a été examinée par la Commission réunie de nouveau à cet effet : elle n'y a découvert aucune trace d'altération, et pour plus de garantie, elle a renouvelé les expériences qui ont eu lieu de la même manière que précédemment. Le lait obtenu cette seconde fois n'a été sous aucun rapport inférieur en qualité à celui de la première épreuve.

La commission a fait ensuite ouvrir la seconde boîte de conserve de M. DE LIGNAC. Elle a étendu de nouveau 200 grammes d'essence dans 800 grammes d'eau et a placé le mélange sur le feu. Au bout de quelques minutes, elle a obtenu cette fois encore, un lait franc, naturel, et d'un goût agréable.

Ces deux opérations terminées, les deux boîtes ont été déposées dans le bureau du commissaire pour y rester ouvertes et exposées à l'air jusqu'au mardi 1<sup>er</sup> mai 1849.

Le 1<sup>er</sup> mai, les boîtes ont été remises à la Commission. L'examen qui en a été fait, les épreuves auxquelles la Commission s'est livrée, ont donné les mêmes résultats que les jours précédents.

Le 8 mai, la Commission réunie pour terminer ses expériences, a de nouveau examiné les boîtes de M. de LIGNAC, dont la première, cette fois, avait supporté le contact de l'air pendant vingt-un jours et la seconde pendant quinze. Les deux boîtes ont été trouvées dans un parfait état de conservation.

La troisième boîte de M. de LIGNAC a été ouverte ce même jour. La conserve qu'elle contenait a paru en tous points semblable à celle contenue dans les deux autres boîtes.



La Commission a fait aussi ouvrir la troisième boîte de lait double, d'après l'ancienne méthode; ce lait était grumelé, exposé au feu il n'a produit qu'un lait aigre, sans homogénéité, offrant en un mot tous les caractères et qualités d'une substance complètement altérée.

*En présence de pareils résultats, la Commission émet sans hésiter, l'opinion que la conserve de M. de LIGNAC, bien supérieure à l'autre, est sous tous les rapports appropriée à l'usage auquel on la destine, et peut être considérée, à juste titre, comme un bienfait pour la navigation.*

Après avoir constaté la supériorité de qualité de la conserve de M. de LIGNAC, la Commission, conformément aux instructions du ministre, s'est aussi occupée de la question d'économie: Elle a été résolue en faveur de M. de LIGNAC. En effet, le lait préparé d'après l'ancienne méthode, coûte de 1,2 à 2,25 le kilogramme. Celui de M. de LIGNAC, coûte il est vrai 6,50 le kilogramme, mais comme il est destiné à n'être employé qu'avec une quantité d'eau quatre fois plus grande, il en résulte qu'un kilogramme de conserve de M. de LIGNAC représente en réalité cinq kilogrammes de lait, ce qui en réduit le prix à 1 f. 30 c. le kilogr.

En outre le lait de M. de LIGNAC est déjà sucré dans une proportion convenable à l'usage, c'est-à-dire cent cinquante grammes de sucre par kilogramme d'essence, il faut lui tenir compte encore de cet autre avantage qui réduit proportionnellement le prix du lait.

*En résumé, la Commission est d'avis qu'il y a lieu de substituer la conserve de M. de LIGNAC aux produits de cette nature dont la marine a fait usage jusqu'à ce jour.*

Les boîtes de M. de LIGNAC, soumises aux expériences de la commission, présentaient les marques suivantes:

Sur le couronnement en plomb qui lie le couvercle à la boîte, on lit: *Dupas*.

Deux centimètres plus bas, on voit un petit écusson en cuivre jaune, qui porte en haut les initiales J. M. L. Au milieu et en toutes lettres, ces mots: *Essence de lait. — S. G<sup>ie</sup> du Gouvernement*. Plus bas est indiqué le prix de la boîte. Le chiffre en a été enlevé au grattoir.

Huit centimètres au-dessous de l'écusson, on lit ces mots imprimés en creux dans le fer blanc: J. L. M. *Brevet d'invention, DUPAS, fabricant*.

La Commission ne donnerait pas ici ces détails insignifiants peut-être, sans l'événement arrivé à l'un de ses membres. Ce membre de la Commission voulant renouveler, à ses frais et à domicile, les épreuves faites au laboratoire de chimie, a acheté en ville, chez un marchand qui se dit le dépositaire unique de la conserve de M. de LIGNAC, deux boîtes de lait qui lui ont été livrées comme provenant de la fabrique de cet inventeur. Ce lait était presque complètement décomposé:

Il n'avait aucune analogie avec celui de M. de LIGNAC.

Les boîtes n'étaient revêtues d'aucune marque extérieure.

La Commission pense qu'il ne sera pas inutile d'appeler, sur ce fait, l'attention de M. de LIGNAC lui-même.

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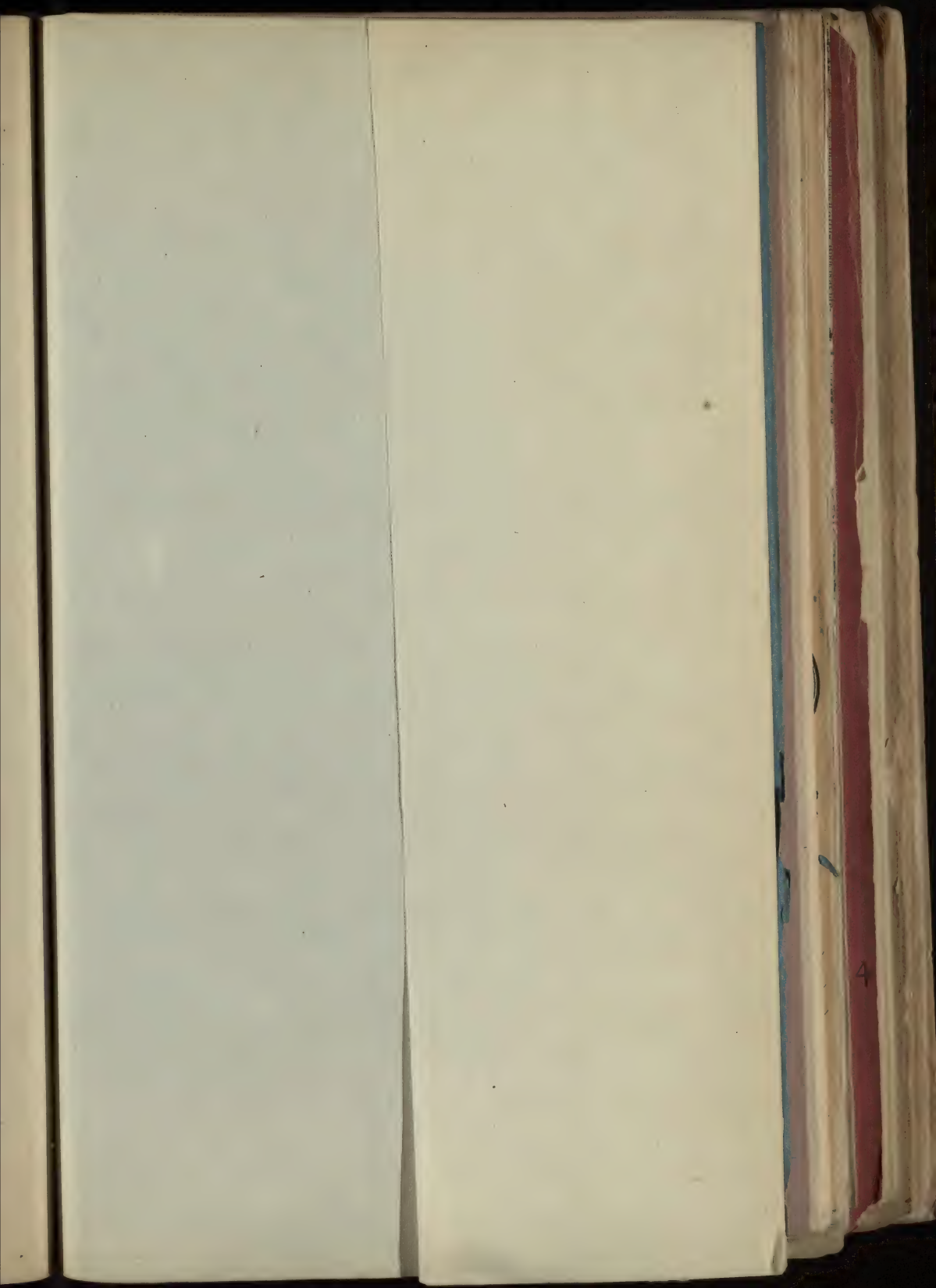
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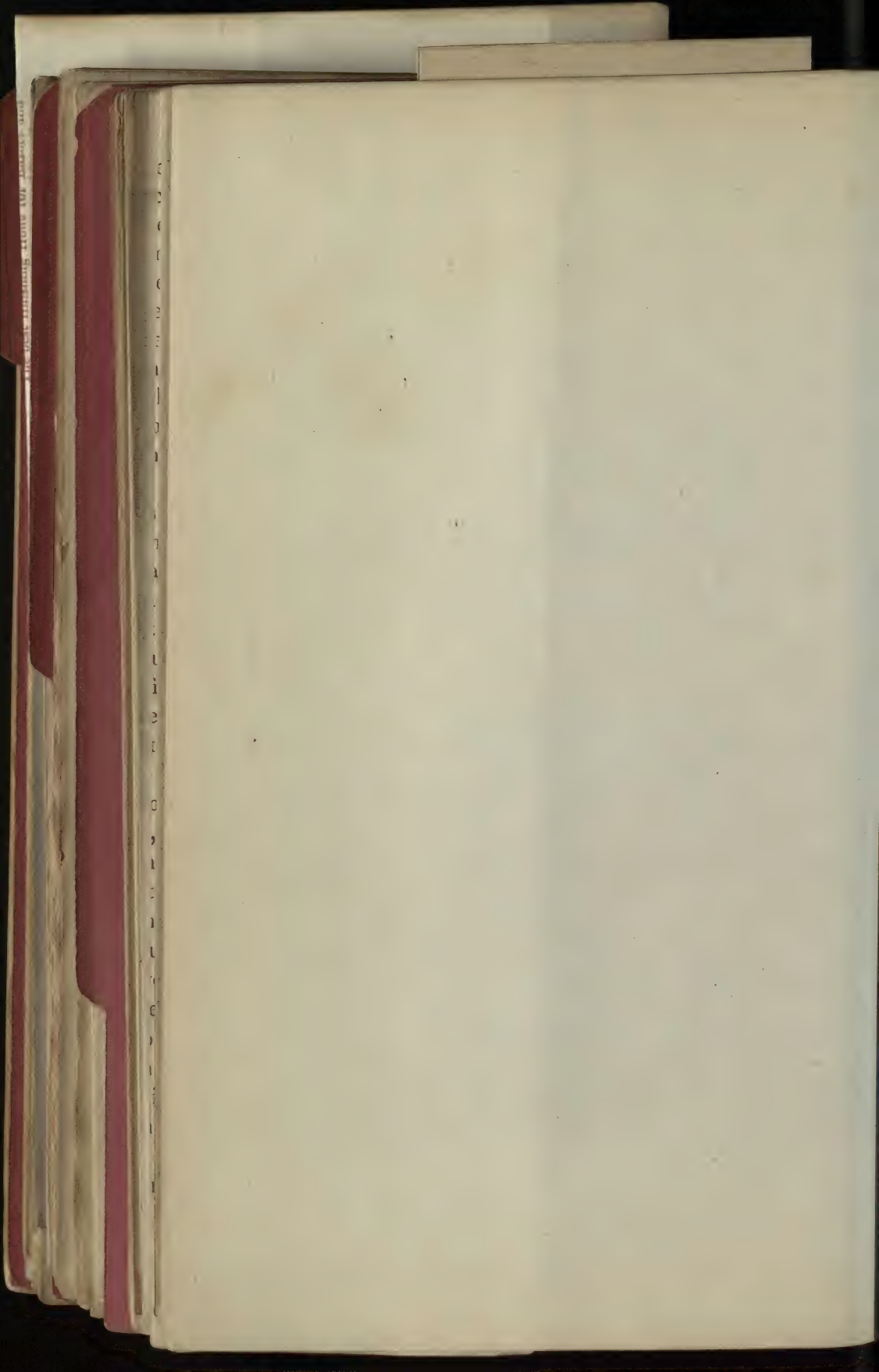
**FOURAT.**

















# Notice sur l'Alimentation

PAR LES DIFFÉRENTES DENRÉES D'UN USAGE HABITUEL,

TELLES QUE

LE PAIN, LA VIANDE, LES LÉGUMES, LA GRAISSE, ETC.,

ET PAR

## LE BISCUIT-BŒUF,

Aliment par excellence, agréable au goût, à l'œil, à l'odorat,

RENFERMANT TOUS LES PRINCIPES

Du Pain, de la Viande, et des Denrées les plus nutritives,

à l'état d'extrême concentration.

PARIS,

CHEZ M. DU LISCOËT FILS ETC<sup>re</sup>,

LUX BARREY DE JOUT, N<sup>o</sup> 43, FAUB. SAINT-GERMAIN.

—  
1851.

*Representant*  
*Arthur Lecoq*  
*Paris*





## DE L'ALIMENTATION EN GÉNÉRAL.

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La vie chez l'homme est une série continuelle de pertes de sa propre substance par le jeu de ses organes et de travaux pour la réparation de sa substance perdue.

Le poumon, dans l'acte de la respiration, introduit sans cesse dans le sang et par suite dans toute l'économie animale l'un des gaz qui composent l'air atmosphérique. Ce gaz, qu'on appelle *oxygène*, est la cause unique et incessante de ces pertes. En sa présence, la fibre musculaire, les membranes, les substances nerveuse et cérébrale, les liquides organiques subissent une véritable combustion, se résolvent en gaz hydrogène, en gaz azote, en carbone, et sortent de l'économie sous des formes nouvelles, résultat de la combinaison de chacun de ces trois éléments avec l'oxygène qui est la puissance. Avec l'hydrogène ce dernier a formé de l'eau qui s'échappe en vapeur; avec le carbone il a formé de l'acide carbonique qui sort par le poumon et par la peau. Le gaz azote suit une voie émonctoire différente; il se trouve dans l'urine, dans les excréments à l'état d'*urée* ou de combinaisons ammoniacales.

La quantité d'oxygène absorbé étant la seule cause de ces métamorphoses de notre substance organique, il est clair que la quantité de nourriture nécessaire pour la conservation de l'individu est dans un rapport direct avec celle de cet oxygène absorbé. Il est également de toute évidence que les aliments doivent contenir les matières propres à reconstituer les parties qui ont subi la combustion, c'est-à-dire de l'hydrogène, du carbone et de l'azote, en proportions relatives.

Si la dose des aliments assimilés est plus grande que la proportion correspondante d'oxygène à laquelle ils doivent être opposés, le poids de l'individu augmente; il se fait une provision de combustibles dans l'organisme; le carbone et l'hydrogène des aliments s'accumulent à l'état de *graisse*, tandis que l'azote contribue à l'augmentation de la fibre musculaire et de toutes les substances *azotées* de notre économie.

Si les aliments, au lieu de renfermer en proportions utiles les trois principes dépensés, ne contiennent que les



deux premiers et sont pauvres ou complètement privés d'azote, l'individu peut ne pas perdre sensiblement de la graisse qu'il avait acquise, car la graisse ne représente dans le corps que de l'hydrogène et du carbone dont la réparation s'effectue, mais la chair musculaire, pour se régénérer, puise dans le sang tout l'azote qui y circule ; le sang qui ne reçoit que deux au lieu de trois éléments, s'appauvrit ; alors la fibre se ramollit, diminue ; bientôt les parties constituant le cerveau viennent fournir à la consommation. Il en résulte de l'égaré dans les idées, une faiblesse générale des organes, enfin, toute résistance à l'acte de la combustion cesse, la vie s'éteint.

L'azote est donc un élément essentiel à l'existence. Les principales parties constituant le sang en contiennent près de dix-sept pour cent ; aucune partie d'organe n'en contient moins.

Toute substance ne mérite donc le nom d'aliment qu'à la condition de pouvoir fournir complètement à la formation du sang et par suite de tous les organes. Sous ce rapport, la chair et le sang des animaux, l'albumine ou blanc d'œuf, le *gluten* des céréales, la caseïne qu'on trouve dans le lait sont des aliments complets. — azote, hydrogène et carbone. — Les animaux qui en font usage se conservent dans un bon état de santé.

La graisse, le beurre, malgré leur origine animale, les huiles, la gomme, les sucres, la bière, le vin, les fécules sont des aliments incomplets. Ils ne sont propres à fournir que de l'hydrogène et du carbone, mais point d'azote. Ils prennent le nom d'aliments *respiratoires*, parce qu'ils peuvent, pendant un temps plus ou moins long, faire face à l'oxygène dans l'organisme, se combiner avec lui directement pour former de l'eau et de l'acide carbonique et préserver ainsi la matière animale de l'action comburante de ce gaz. Mais encore, ces aliments ne sauraient entretenir la vie à défaut d'azote. Aussi les animaux soumis à leur usage meurent-ils dans un espace de temps assez court.

De tout temps on a cherché un aliment renfermant à l'état de concentration tous les principes nécessaires à la vie, et qu'on trouve disséminés dans le pain, dans la viande, dans les légumes.

## DU BISCUIT-BOEUF.

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Le BISCUIT-BOEUF, préparé par MM. de Lisouët, rue Barbet de Jouy, n° 42, est, comme l'indique son nom, un aliment qui renferme, à l'état concentré, sous un volume portatif, les éléments nutritifs du pain, de la viande et des autres denrées alimentaires les plus convenables pour la réparation des forces humaines et pour l'entretien d'une vigoureuse santé.

Six cents grammes de *biscuit-bœuf* équivalent à la ration journalière du soldat français, qui se compose de : viande 285 grammes, pain de munition 750 grammes, pain blanc 316 grammes, légumineux 200 grammes; total de la ration du soldat : 1,551 grammes.

Manger six cents grammes de BISCUIT-BOEUF, c'est introduire dans l'estomac l'équivalent de la ration qui vient d'être mentionnée; cette même dose de biscuit-bœuf correspond à deux kilogrammes de pain ordinaire.

Les preuves de l'importance alimentaire du biscuit-bœuf, et de sa valeur proportionnelle comparée à celle des autres denrées, résultent de documents précis et concluants qui sont rapportés textuellement dans la brochure. Ces documents sont :

1° Le rapport de MM. les syndics de la boulangerie de Paris, qui ont examiné le produit au point de vue de leur art;

2° Le certificat de MM. les OFFICIERS et SOUS-OFFICIERS du 55<sup>e</sup> de ligne, dont le 1<sup>er</sup> bataillon, ainsi qu'un bataillon du 7<sup>e</sup> régiment léger, ont été soumis à l'usage du biscuit-bœuf;

3° La déclaration de M. le GÉNÉRAL FEUCHÈRE, inspec-



teur de division militaire, qui a fait faire les expériences sous ses ordres ;

4° La lettre de M. le GÉNÉRAL MYLIUS, qui constate que le biscuit s'est conservé pendant dix-huit mois sans altération, malgré l'absence de précautions quelconques ;

5° L'opinion de M. GÉRARD, officier principal, comptable de l'administration des vivres de Paris ;

6° Enfin, le rapport de M. JULES BARSE, chimiste, qui, dans la vérification de la valeur alimentaire du biscuit-bœuf, a apporté la sévère circonspection que lui impose sa qualité d'expert près la cour d'appel de Paris.

Par ces documents on voit que le biscuit-bœuf est destiné à entrer dans la consommation journalière, à protéger les hommes contre la disette, à servir de ressource dans toutes les circonstances de la vie. Ainsi :

Les troupes envoyées en expédition dans un pays dénué de provisions ;

Les places fortes, dans la prévision d'un siège ;

Les navigateurs exposés, dans une longue traversée, à l'épuisement des denrées fraîches, ou de grand volume ;

Les ouvriers loin du foyer domestique ;

Les mères de famille désireuses d'avoir à la disposition des enfants des potages substantiels ;

Toutes les classes, en un mot, viendront à l'usage habituel du biscuit-bœuf, aussitôt qu'une première expérience leur en aura prouvé les avantages.

Le biscuit-bœuf se prête à toutes les combinaisons alimentaires ; mangé à la main, comme un gâteau, il remplit l'estomac et le rassasie bientôt par suite du gonflement des éléments nutritifs qu'il renferme à l'état de concentration.

Mis dans de l'eau simple, le biscuit-bœuf se transforme, par l'ébullition, en un potage gras substantiel. De quelque manière, en un mot, qu'il soit introduit dans l'économie, il

rend au corps de l'homme l'usage de toutes ses facultés. Il fournit abondamment aux fonctions du poumon par les aliments hydrogénés et carbonés qu'il renferme; il rétablit, dans de larges proportions, les pertes de l'organisme, en versant dans la circulation du sang les principes azotés qui constituent la fibre musculaire.

La composition du biscuit-bœuf est l'expression la plus vraie, la plus rationnelle de toutes les découvertes de la science. Les travaux des savants, tels que MM. Dumas, Payen, Liébig, etc., ont été étudiés, expérimentés longuement, et c'est après des recherches de dix années que l'auteur, M. DE BEURMANN, a voulu enfin doter son pays d'un produit qui est sorti victorieux des expériences pratiques et de l'analyse des chimistes.

Une substance aussi importante ne pouvait pas être livrée au commerce sans des précautions spéciales.

La cupidité, la fraude n'auraient pas tardé à s'emparer d'un semblable moyen d'exploitation de la confiance publique. Aussi, pour mettre le consommateur à l'abri de tout danger, le biscuit-bœuf ne sera-t-il livré qu'avec les garanties qui assurent sa bonne composition.

Les provisions destinées au long cours et à l'armée seront vendues par caisses scellées de l'estampille de l'auteur.

Les provisions de détail seront vendues sous une enveloppe scellée également de la même estampille.

#### *Manière de se servir du biscuit-bœuf.*

Le biscuit destiné aux potages est marqué d'une lettre P, le biscuit destiné à être mangé à la main ne porte pas d'empreinte.

Pour faire le potage, on casse un biscuit en petits morceaux, on le met ainsi dans de l'eau simple froide. On fait



chauffer le tout pendant 30 à 40 minutes sur un feu doux, afin d'empêcher que le potage ne prenne au fond du vase par l'action du feu pendant l'ébullition.

Pour un biscuit de 300 grammes, on emploie *deux litres d'eau*. Pour un biscuit de 100 grammes, on emploie 750 grammes d'eau, c'est-à-dire trois quarts de litre.

Selon le goût, on augmente la dose du sel ; mais les proportions de sel qui sont dans le biscuit naturel sont les plus favorables pour que l'usage du biscuit puisse être prolongé sans occasionner la soif.

Les biscuits de 300 grammes sont la dose nécessaire pour le repas d'un homme qui travaille. Les biscuits de 100 grammes sont faits pour donner aux ménagères, aux nourrices, aux convalescents, le moyen de préparer un potage à toute heure, avec promptitude et facilité. Cette dose suffit pour le repas d'une femme qui travaille à l'aiguille, ou qui ne fait pas d'exercice violent dans sa profession.

## CERTIFICATS.

### *Syndicat des boulangers de Paris.*

Nous, syndics des boulangers soussignés, sur la demande que nous a faite M. de Beurmann, capitaine rapporteur au 2<sup>e</sup> conseil de guerre de la 1<sup>re</sup> division militaire, avons examiné plusieurs échantillons de biscuit de son invention, auquel il a donné le nom de biscuit animalisé ; M. de Beurmann a également remis sous nos yeux une attestation de M. le général de Mylius, constatant que ce biscuit a bien été fabriqué d'après son procédé, et prouvant de plus la conservation de ce biscuit, dont un des échantillons qui nous a été soumis, d'après le dire de M. de Beurmann et l'attestation précitée, aurait été conservé pendant dix-huit mois, par mégarde, sans

aucune précaution, et cela sans avoir subi aucune détérioration dans sa qualité ni dans son goût.

De plus, M. de Beurmann nous a présenté un autre échantillon qu'il nous a assuré avoir été fabriqué depuis plus de deux ans.

Pour nous convaincre que le biscuit suffisait seul à composer un potage gras, substantiel, nourrissant et agréable au goût, sous nos yeux et dans notre cabinet, M. de Beurmann en a fait l'expérience : en moins de 45 minutes, dans un litre d'eau, une demi-ration de ce biscuit (150 grammes) nous a donné un excellent potage, dans les conditions énoncées, et nous pensons que, sous cette forme, ce produit pourrait convenir à toutes les classes de la société.

Il ne nous appartient pas, simples praticiens, de nous prononcer absolument sur les qualités nutritives de ce biscuit, ni sur la quantité approximative qu'un homme, soit militaire, marin, ou travailleur, pourrait en consommer par jour.

Pour nous résumer, nous disons qu'il nous paraît que le biscuit de M. de Beurmann peut, dans les conditions extraordinaires, en l'absence d'autres aliments, ou pour augmenter les rations de vivres, faire une nourriture suffisante pendant un certain laps de temps plus ou moins long, suivant le tempérament des individus.

Ce que nous connaissons de la fabrication du biscuit ordinaire, la qualité des farines et des autres produits qui composent le biscuit animalisé, nous autorise à dire que ce biscuit doit être d'une bonne conservation, et que M. de Beurmann ne doit avoir rien exagéré en nous indiquant la durée de conservation dont nous parlons plus haut.

Nous pensons que le goût épicé de ce biscuit serait un obstacle pour en faire la nourriture habituelle de beaucoup



d'individus ; cet inconvénient disparaît lorsqu'il est consommé sous forme de potage, et M. de Beurmann nous a dit que son intention était d'en composer d'un assaisonnement moindre pour être mangé sec (1).

Nous croyons que par cette invention M. de Beurmann peut rendre des services aux navigateurs exposés dans une longue traversée à voir leurs rations de vivres diminuer ; l'avantage de ce biscuit, par son peu de volume, serait de pouvoir être distribué à des troupes envoyées en expédition dans un pays dénué de ressources, et d'en approvisionner les places fortes dans la prévision d'un siège.

Nous déclarons en terminant que la fabrication de ce biscuit nous paraît parfaitement bien exécutée.

En foi de quoi nous avons signé le présent pour servir en tant que besoin.

Paris, le 13 décembre 1850.

*Les syndics des boulangers de Paris,*

Signé : BERGER, DOISNEAU, FREMONDEAU et C. TALANGE.

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Paris, le 2 décembre 1850.

*Inspection générale de 1850.*

MON CHER CAPITAINE,

J'ai reçu la lettre que vous m'avez écrite relativement aux expériences que vous avez faites en 1844, au camp de Saint-

(1) Il y a en effet dans le commerce du biscuit-bonif destiné aux potages, et du biscuit moins épicé pour être mangé à la main.

Omer , pour prouver que le biscuit animalisé de votre invention pouvait, dans quelques cas, remplacer avantageusement les rations de pain, de viande et de légumes secs. Je me rappelle très-bien qu'à cette époque j'ai mis à votre disposition des troupes du 7<sup>e</sup> léger et du 55<sup>e</sup> de ligne, et que les résultats de l'essai qui a été fait alors de votre biscuit ont été jugés satisfaisants d'après les rapports mêmes des chefs de corps.

Je désire que cette lettre remplisse le but que vous vous êtes proposé en me la demandant , et que vous réussissiez complètement dans l'entreprise que vous projetez.

Recevez , mon cher Capitaine, l'assurance de mes sentiments affectueux.

*Le général de division, inspecteur général,*

Signé : DE FEUCHÈRES.

---

*Certificat de MM. les Chefs de corps du 55<sup>e</sup> régiment  
de ligne.*

Nous, soussignés, officiers et sous-officiers du 1<sup>er</sup> bataillon du 55<sup>e</sup> de ligne, certifions qu'en 1844, au camp de Saint-Omer, deux bataillons, un du 7<sup>e</sup> léger et un du 55<sup>e</sup>, furent mis, par ordre de l'autorité supérieure, à la disposition de M. le capitaine de Beurmann, actuellement en retraite à Paris, inventeur du biscuit animalisé, afin de pouvoir faire l'épreuve de cette subsistance.

Nous certifions en outre que ces deux bataillons passèrent la nuit au bivouac, et qu'il ne fut distribué à chaque homme qu'un biscuit du poids de 250 grammes pour le repas du



matin, en remplacement de pain, viande, légumes et sel qu'on donne habituellement aux troupes en campagne. Cette épreuve fut reconnue bonne, et la quantité de biscuit distribuée suffisante pour un repas.

En conséquence, nous pensons que le biscuit de M. de Beurmann peut être employé avec avantage à la guerre, dans les cas extraordinaires, voyages de long cours, etc.

Fait à Saint-Brieuc, le 1<sup>er</sup> décembre 1850.

Signé : LAVERGNE, cap. ; DE BEAULINCOURT, adj.-major ; MATHIEU, chef de bat. ; FRIANT, adj. ; DEVICQUE, serg. ; FRIANT, lieuten. ; MERLE, sous-lieuten. ; ROLLAND, capit. ; ORMOT, sous-lieuten. ; ROBIN, sous-lieuten. ; LEMAIRE, cap.

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*Lettre de M. le général Mylius.*

Paris, le 17 septembre 1850.

MON CHER CAPITAINE,

Ainsi que vous m'en avez témoigné le désir, je vous renvoie votre biscuit animalisé que vous m'aviez donné pour le manger, il y a plus de quinze mois, et que j'ai oublié dans mon armoire sous le toit exposé au soleil du midi; il était enveloppé dans un journal que je joins, et je mets sous bande cachetée le biscuit, que vous pouvez ainsi faire examiner, si dans son intérieur il est aussi bien conservé qu'il l'est extérieurement; ni le froid ni l'extrême chaleur n'ont produit aucune altération extérieurement.

Je désire que ce témoignage que le hasard me met à même

de vous donner, puisse vous être utile et faire apprécier l'utile invention que vous avez faite.

Recevez, mon cher capitaine, l'assurance de mon amical attachement.

*Le général de brigade,*

Signé : F. DE MYLIUS,

22 bis, rue de Rivoli.

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*Lettre de M. Gérard, officier principal, comptable de l'administration des vivres, à Paris.*

Paris, le 19 décembre 1849.

A MONSIEUR DE BEURMANN.

Vous m'avez posé au sujet de votre biscuit animalisé une série de questions auxquelles je m'empresse de répondre.

QUESTION 1<sup>re</sup>. Pensez-vous que le biscuit animalisé, de mon invention, soit une bonne nourriture, capable de remplacer avantageusement la viande, le pain et les légumes dans les cas extraordinaires d'une longue navigation sur mer, pour les ouvriers de la Californie ou autres?

RÉPONSE. Oui, ce biscuit est une bonne nourriture dans des cas extraordinaires et pour un temps limité; il remplacera très-bien les autres denrées, telles que viande, pain, légumes, etc.

Q. 2<sup>e</sup>. Ce biscuit est-il dans les conditions voulues pour être conservé longtemps, et quelle en sera la durée en le conservant hermétiquement dans des caisses doublées de zinc, pour le préserver de l'humidité, des mites ou insectes?



R. En prenant les précautions indiquées ci-contre, ce biscuit pourra se conserver sans altération pendant au moins douze ou quinze mois.

Q. 5°. Peut-on se nourrir de ce biscuit pendant quinze jours de suite, sans crainte pour la santé des hommes?

R. Tout ce qui entre dans ce biscuit étant parfaitement sain, on peut certainement s'en nourrir pendant plus ou moins de temps sans le moindre danger pour la santé : une seule chose serait à craindre, c'est que certains hommes ne se fatigassent de prendre longtemps une même nourriture; pour quelques estomacs, tout comestible, quelque bon qu'il soit, devient bientôt pâté d'anguilles si on en mange constamment.

Q. 5°. En n'usant de ce biscuit que deux ou trois fois par semaine, pourrait-on s'en nourrir ainsi toute l'année sans altérer la santé.

R. Je n'oserais être complètement affirmatif à ce sujet; rigoureusement la chose est possible, puisque l'alimentation est saine et suffisante, mais il faut craindre les caprices d'estomac, ainsi qu'on vient de le dire.

Q. 6°. Pensez-vous enfin que mon biscuit soit assez animalisé pour en obtenir un potage gras assez nourrissant pour les ouvriers, et que 500 grammes par jour soient suffisants en ne mangeant pas autre chose?

R. Je réponds affirmativement sur tous les points, sous la restriction toutefois que ce mode de nourriture ne sera pas prolongé indéfiniment, et qu'on augmentera, s'il le faut, la ration de 100 ou de 200 grammes, suivant la force des hommes et la durée ou la fatigue de leur travail.

Telle est mon opinion consciencieuse, plutôt restreinte et timorée qu'exagérée ou hasardée : on peut croire que je ne fais pas le moins du monde acte de complaisance, puisque je suis plutôt au-dessous qu'au-dessus de la vérité.

Signé : GÉRARD.

*RAPPORT de M. Jules Barse, chimiste, expert en matière civile et criminelle près la cour d'appel de Paris.*

J'ai été chargé d'examiner au point de vue alimentaire et au point de vue commercial le biscuit de M. de Beurmann, et de reconnaître si ce produit, fabriqué d'après la formule donnée par l'auteur, réunit les avantages qui lui sont attribués.

Pour répondre en toute connaissance de cause, j'ai demandé à M. de Beurmann un biscuit conservé *depuis deux ans*, et j'ai prié cet auteur de faire fabriquer devant moi, d'après sa formule, de nouveaux biscuits.

Ainsi muni de produits et de la formule, j'ai procédé à l'examen des questions suivantes :

PREMIÈRE QUESTION. — Quelle est la valeur alimentaire du biscuit animalisé? En quelle dose peut-il remplacer la ration du soldat, c'est-à-dire suffire à l'alimentation d'un homme qui travaille?

Aujourd'hui la valeur nutritive des principales denrées a été déterminée dans une échelle proportionnelle par les chimistes. On sait quelle quantité de substance peut remplacer telle quantité de toute autre substance, et l'échelle graduée qu'on a dressée a pour point de départ une base fixe, invariable, *c'est le blé*. Ainsi, pour toute denrée nouvelle, la question se réduit maintenant à savoir quelle quantité de blé de bonne qualité représente le produit nouveau.

Comme la science a parfaitement déterminé, d'un autre côté, quelle est la dose en blé qu'un homme bien portant doit manger par 24 heures pour se maintenir en santé, sans déperdition de ses forces ou de son propre poids, on déter-



mine ainsi avec la plus grande précision la valeur alimentaire de toute substance encore inconnue.

Or, d'après la formule de M. de Beurmann et d'après la stricte exécution qui en a été faite pour les biscuits que j'examine, cinq kilos de ce produit renferment :

1° En matière animale analogue à la viande, 2,397 grammes équivalant en blé à . . . . . 4,438 grammes.

2° En matière alimentaire analogue à la farine, 3,660 grammes équivalant en blé à . . . . . 4,375 idem.

3° En condiments destinés à la conservation ou à rendre le goût agréable, 52 grammes sans valeur nutritive.

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En blé, total . . . . . 9,013 grammes.

Ainsi 9 kilos 13 grammes de blé se trouvent concentrés en 5 kilogrammes par la combinaison des éléments plus nutritifs que le blé dans le biscuit-bœuf.

Or, la ration journalière d'un soldat, en blé, se composerait de 1,500 grammes. Il suffit de rechercher combien de fois le nombre 1,500, chiffre d'une ration de soldat, en blé, est contenu dans le nombre 9 kilos 13 grammes pour savoir quelle devra être la quantité de biscuit nécessaire à la ration d'un homme par jour. Cette opération indique que 600 grammes de biscuit par jour assureront la santé et la vigueur tout aussi bien que 1,500 grammes de blé, soit 2 kilos de pain. Donc, le biscuit a l'avantage de présenter sous un petit volume une grande puissance alimentaire; quant à la saveur, à l'aspect, il suffit de voir un biscuit pour en juger aussi bien que moi, c'est-à-dire pour le trouver parfait.

Supposons un équipage de dix hommes d'un navire pêcheur voulant éviter la famine en s'approvisionnant de biscuit-

bœuf pour les cas de disette en denrée d'autre nature; il prendra pour trois mois de ce produit à raison de 6 kilos par jour pour les dix hommes, soit 540 kilos, pour une somme de ~~cinq-cent quarante~~ <sup>678</sup> francs.

2<sup>e</sup> QUESTION. — Le biscuit se conservera-t-il? Quel est l'effet de son emploi journalier?

L'auteur m'a remis un biscuit de deux ans, c'est le témoin le plus positif de cette conservation. Maintenant, en théorie, les éléments sont associés dans les bonnes conditions de conserve. Je crois pouvoir affirmer que, déposés dans des boîtes de fer-blanc, les biscuits pourront supporter la mer pendant deux et trois ans sans avarie, surtout avec le système d'emballage dont je vais parler bientôt.

L'emploi du biscuit se fait de deux manières : En potage, trois quarts d'heure d'ébullition dans l'eau simple le transforment en excellent consommé.

Mangé à la main comme un gâteau, le biscuit à potage provoquerait, selon moi, à cause des condiments épicés qu'il renferme, une soif assez vive. Sans cela, il pourrait très-bien être employé ainsi et surtout être mangé avec du pain. Je proposerai donc à l'auteur de réduire pour le biscuit à la main la dose des condiments, qui ne sont là que comme principes conservateurs, et d'employer contre les avaries un emballage au moyen de plantes aromatiques desséchées. Alors le biscuit aura tous les avantages qui lui sont propres sans provoquer la soif autrement que tout aliment usuel.

#### *En résumé.*

J'ai apporté dans l'appréciation du biscuit de M. de Beurmann la sévère circonspection que me donnent mes fonctions d'expert devant les cours d'assises : deux modifications m'ont paru nécessaires, je les ai signalées. Ainsi, je déclare



que l'on doit porter à 600 la ration que l'auteur croyait suffisante à 500 grammes pour un homme qui travaille; de même je suis d'avis qu'il faut remplacer la trop forte quantité de condiments, ou principes conservateurs, par un système de préservation *externe*, c'est-à-dire par l'emballage aromatisé.

Sauf ces deux observations, mon avis est que le biscuit de M. de Beurmann est fabriqué dans les plus heureuses conditions de valeur nutritive, de saveur propre à provoquer l'appétit et la digestion, enfin de durée dans la conservation de ses principes alimentaires.

Je renvoie aux mémoires de M. de Beurmann, pour tout ce qui ne concerne pas spécialement mon office de chimiste.

Paris, le 15 juillet 1850.

Signé : Jules BARSE,

chimiste en matière civile et criminelle.

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J'ai omis un détail qui, peut-être, aurait dû figurer dans l'appréciation commerciale que j'ai dû faire.

Quel est le poids dont un soldat serait chargé si l'on adoptait le biscuit en campagne?

Pour un jour : 600 grammes.

Pour dix jours : 6 kilogrammes.



Cette surcharge décroît naturellement chaque jour par suite de la consommation journalière. Ainsi, au dernier jour de la campagne, le soldat se trouve, comme le sage de l'antiquité, délivré de la provision qui a assuré son existence.

Signé : Jules BARSE.

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Le BISCUIT-BŒUF est la ressource la plus précieuse  
comme aliment substantiel, portatif, inaltérable dans  
sa conservation pendant plus de deux ans.

Il est destiné à toutes les classes, à tous les âges.

La Marine, l'Armée, les Ouvriers trouveront dans  
son usage une alimentation des plus commodes.

Un potage fait avec 300 grammes de Biscuit-Bœuf  
représente la valeur nutritive de la ration d'un  
soldat.

# FRENCH ALIMENTARY PASTES & STARCHES

The Pastes contain Gluten

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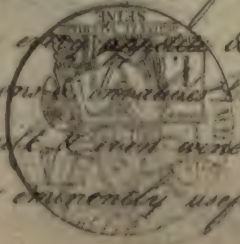
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*These pastes, much superior to those of Italy in taste and quality possess principally the nutritive substance, Gluten.*

Gluten is the essence of corn: it is that azotic substance the analogy of which with meat has been proved by the most learned chymists of Europe. The learned men of France, M. M. Cheinard, Dumas, Vauquelin, those of other countries, Berzelius, Liebig, with a multitude of others have affirmed that of all alimentary substances Gluten is that which at equal weight & volume contains the most real nutrition without even the exception of meat.

The hygienic properties of French Pastes are as incontestable as their substantial qualities. Better dried and more refined than those of Italy they suit every constitution ~~and every age~~ & every fortune. Children old persons & Invalids. The facility of cooking them in soup, milk & even wine without turning sour renders them ~~extremely~~ useful as





provisions on sea or land. They will keep without losing either quality or flavour for several years. Instead of thickening soup they clarify it.

The process of their manufacture permits industry to use with advantage the residue of meal or flour from which Gluten has been extracted & lowers the price of French Pastes to a sum that no opposition can reach.

For the convenience of those who retail these pastes, they are made up in parcels of half a kilo, or one pound, with directions for use.

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These Pastes are bruised and moulded in all forms Vermicelli, Macaroni &c. — and are recommended by the most celebrated doctors

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# EXPOSITION UNIVERSELLE

de

1851. L O N D R E S 1851.

## PÂTES FRANÇAISES

Les plus belles du Monde  
Voir et comparer n° 1337 du Catalogue.



**MAGNIN,**

**A CLERMONT-FERRAND.**

Moulins, Fabrique de Semoule, Vermicelle, Macaroni, etc.

**FARINES DE LÉGUMES CUITS.**



M<sup>r</sup> MAGNIN a envoyé à l'Exposition une belle collection de Farines de légumes cuits et de Pâtes dites de Gènes. Ces produits sont supérieurs à tous ceux de ce genre qui figurent à l'Exposition. Le Jury signale ce fait en faveur des consommateurs, et récompense l'industrie remarquable dont il a donné l'exemple.

(Rapport du Jury central. M. DARCET, rapporteur.)

**PÂTES FRANÇAISES**, Les plus belles du Monde,

la nuance, la pureté, la finesse, la transparence effacent tout ce que les pâtes de Naples nous avaient jusque-là apporté de plus beau: pâtes dont la saveur exquise au goût n'appartient qu'à elles-mêmes, et à quelque chose de ce qui tient essentiellement au cru, qui caractérise particulièrement les productions d'essence privilégiée et les classe partout au premier rang

(M<sup>r</sup> DUMAY Rapporteur.)



# REPORT

OF THE

COMMISSIONERS OF THE LAND OFFICE

IN

RESPONSE TO A

RESOLUTION OF THE HOUSE OF COMMONS

PASSED

THE 14TH MARCH 1845

IN

1845

LONDON: PRINTED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD.

1845

# RAPPORT

FAIT ,

AU NOM D'UNE COMMISSION ,

A LA SOCIÉTÉ CENTRALE D'AGRICULTURE  
DU PUY-DE-DOME,

PAR M. DUMAY,

SUR

LE FROMENT ROUGE GLACÉ  
D'Auvergne ,

ET SON EMPLOI A LA FABRICATION DES PÂTES

FAÇON DE GÈNES OU D'ITALIE.



Organe de la Commission que vous avez nommée , à l'effet de vérifier et d'examiner les produits en pâtes , façon de Gènes ou d'Italie , ainsi que les échantillons de blé d'Auvergne que M. Magnin , vermicellier à Clermont-Ferrand , se propose de présenter à la prochaine exposition universelle de Londres , je viens , Messieurs , vous rendre compte des résultats de notre examen et



vous exposer en même temps les titres nombreux , puissants , imprescriptibles de ce fabricant distingué à la reconnaissance de l'agriculture de notre département.

Parmi les variétés de blé les mieux appropriées au sol de la Limagne , tant pour le rendement que pour la prospérité et le succès de la végétation , le froment rouge tient le premier rang , comme plus productif , moins sujet à verser , plus riche en principes nutritifs , et partant plus alimentaire.

Par des circonstances non encore définies , mais qui , d'après l'opinion la plus généralement accréditée , se rapportent au climat , aux courants atmosphériques et à la nature volcanique du sol , ce blé , dans un grand nombre de localités de notre contrée , arrive à maturité à l'état glacé. A cet état , la farine qui en provient le rend , par son défaut de blancheur , impropre à faire du pain blanc , et pour son emploi à la panification , comparativement à nos blés blancs , il subissait et subirait encore sur nos marchés une dépréciation marquée dont nos informations nous permettent de fixer le chiffre à deux francs au moins par hectolitre.

Il est , par sa nature , dur , rustique , revêche , et très-coriace. Il ne ressemble en rien aux blés durs des autres pays , notamment des départements méridionaux de la France et aux beaux blés d'Italie , de Sicile , de la Crimée et du Maroc , qui ne doivent leur dureté qu'à un effet de chaleur , et dont la maturité parfaite ,

accomplie sous l'influence et l'action d'une lumière plus vive, d'un soleil plus ardent, leur donne une supériorité incontestable de pureté, de blancheur, d'intégrité et de beauté, à laquelle évidemment nous ne saurions prétendre pour le blé dont il s'agit.

Mais si, sous tous ces rapports, nos blés rouges glacés sont inférieurs à ceux que nous venons de citer, et doivent reconnaître leur prééminence, en revanche il n'est pas moins vrai qu'ils recèlent en eux des qualités précieuses, inestimables, qui leur sont propres, qui n'appartiennent qu'à eux, qui en font un blé prédestiné pour la fabrication des pâtes, supérieur et préférable à tous autres dans cet emploi, et qui consistent dans ce parfum, dans cet arôme, dans cette saveur délicate et agréable au goût, qui distinguent particulièrement les pâtes et vermicelles faits avec les semoules qu'ils fournissent, les font rechercher de plus en plus par la consommation, et préférer, à raison de leur excellence, aux meilleurs et aux plus beaux produits d'Italie (1).

Aussi ce froment rouge, dur, glacé, dont tout-à-l'heure et en dehors de son application à la fabrication des pâtes, nous reconnaissons l'infériorité, et que je vous signalais comme subissant une dépréciation marquée,

(1) Les pâtes, vermicelles, macaronis, etc., fabriqués avec les blés étrangers qui ont supporté la mer, ont un goût de rance très-prononcé, qui prend fortement au gosier quand on les mange.



est aujourd'hui celui qui, sur nos marchés, réalise le plus haut prix, et que nos semouleurs n'hésitent pas à payer, dans les belles qualités, deux et trois francs par hectolitre de plus qu'aucun autre.

Ainsi, Messieurs, d'une part deux francs de moins, d'autre part, deux à trois francs de plus, voilà bien une différence de quatre à cinq francs par hectolitre ajoutée à la valeur de ce blé, reconnu comme le plus productif par le rendement, et qui, par la force de sa tige et la vigueur de sa végétation, répond aussi le mieux au degré de puissance du sol qui le produit chez nous.

Dans la consommation de blé rouge glacé, actuellement opérée par la fabrication des semoules dans notre département, cette seule plus-value de quatre à cinq francs par hectolitre constitue au profit de sa culture, dans notre Limagne, une prime annuelle de huit à neuf cent mille francs, dont elle doit tout le bienfait à l'industrie des pâtes qui, nous aimons à le répéter, par la plus heureuse des métamorphoses d'un blé, le moins convenable à la boulangerie, et par conséquent déprécié, en a fait un blé spécial, privilégié, hors ligne, et de la plus haute valeur vénale.

La part qui revient à M. Magnin dans cette transformation féconde a été si grande, que sans lui, peut-être, nous devons le dire et le proclamer bien haut, elle eût cessé d'exister, et serait encore à naître.

Nous allons le démontrer.

Avant l'établissement de M. Magnin à Clermont-Ferrand, établissement qui date de 1830, la fabrication des pâtes, déjà installée dans cette ville, ne s'y exerçait que sur une petite échelle, car nous voyons dans la statistique du Puy-de-Dôme, publiée en 1834 par M. Gonod, que même alors elle n'occupait qu'une cinquantaine d'ouvriers et quatre-vingts femmes environ, qui, probablement encore, devaient, pour la plupart, être attachés à la fabrique de M. Magnin. Cette fabrication ne pouvait donc avoir chez nous, en 1830, que de faibles proportions, et l'état dans lequel M. Magnin la trouva à cette époque était un état de décadence complète et de ruine certaine.

Expliquons-en les causes.

Les conditions de cette industrie, sous le double rapport de la matière première et du climat, sont loin d'être les mêmes chez nous qu'en Italie. Son beau ciel et son beau blé nous manquent à la fois; la composition élémentaire de nos blés rouges glacés diffère notablement de celle des blés de Naples et de Sicile. Aussi riches en gluten, ils contiennent beaucoup plus de matières mucilagineuses, albumineuses et gommo-sucrées, tous principes nutritifs, mais dont la présence, compliquant singulièrement la manipulation de ces pâtes, rendait indispensables des modifications



nombreuses aux procédés suivis partout ailleurs (1).

De plus, l'état atmosphérique, les variations de température, si fréquentes dans notre contrée, l'électri-

(1) La supériorité de nos blés rouges glacés se constate par leur poids, 88 à 89 kilogrammes l'hectolitre, par leur richesse en substances azotées et leur combinaison chimique.

Presque aussi riches en gluten que les blés qui en contiennent le plus, ils renferment en albumine, en matières gomme-sucrées et mucilagineuses, toutes substances azotées et nutritives, des quantités hors de toute proportion avec tous les blés connus, et dans aucun autre ces substances combinées n'existent dans des conditions naturelles aussi harmonieuses.

D'après M. Payen et les analyses de nos plus savants chimistes, le blé dur le plus riche en substances azotées en contient un peu plus du double de ce que renferme le blé blanc, et la proportion d'amidon s'y trouve en raison inverse de ces mêmes substances, ainsi qu'il résulte de la classification suivante dressée d'après l'analyse de M. Payen (*Précis de chimie industrielle*, nouvelle édit. p. 466.)

|                                     | Amidon. | Substances azotées<br>et gluten. |
|-------------------------------------|---------|----------------------------------|
| Blé dur de Venezuela (Amérique).... | 58.42   | 22.73                            |
| Blé dur de Tangarok.....            | 63.30   | 20.00                            |
| Blé dur d'Afrique. ....             | 64.57   | 19.50                            |
| Blé demi-dur de Brie.....           | 68.65   | 16.25                            |
| Tuzelle.....                        | 75.30   | 11.65                            |

On voit par ce tableau que le blé dur le plus riche en substances azotées et gluten, et qui a le plus de valeur nutritive, le blé de Venezuela, est en même temps celui qui contient le moins d'amidon.

Or, le blé rouge, dur, glacé, d'Auvergne, contient à peine 45 p. 100 d'amidon, c'est-à-dire près de 25 p. 100 de moins que le blé de Venezuela, et cette énorme différence est compensée chez lui par une quantité équivalente de substances azotées, telles que gluten, matières grasses, mucilagineuses et gomme-sucrées, qui en font un blé unique, exceptionnel, et donnent à ses produits naturels, aux pâtes d'Auvergne, une supériorité si grande sur toutes les autres pâtes, et surtout sur les produits artificiels, gluten granulé, etc., qui ont

citée dans les orages, toutes circonstances invisibles, fugitives, enveloppées de mystère, qu'il est si difficile de saisir et de maîtriser, et dont l'influence cependant joue un si grand rôle dans cette manutention : toutes ces circonstances, disons-nous, opposaient la difficulté de leurs problèmes à résoudre, pour en conjurer les pernicioeux effets par l'adoption de nouveaux modes mieux appropriés pour la dessiccation, la distribution de la chaleur et des courants d'air isolés ou combinés ensemble, suivant l'état de la température ambiante et les besoins de la fabrication.

Contre tant de difficultés réunies que pouvaient les devanciers de M. Magnin ? Elles avaient passé inaperçues à leurs yeux ; pour les vaincre, il fallait les distinguer ; ils n'en avaient pas même soupçonné l'existence.

Dès lors les produits qui sortirent de leurs mains furent aussi défectueux que leur fabrication était vicieuse, et ne réussirent qu'à justifier l'antique renommée des pâtes d'Italie, qu'à consacrer et étendre leur suprématie et à faire passer à l'étranger la majeure partie du capital destiné à alimenter la France de ce produit. Un relevé des douanes de 1828 à 1837 cons-

perdu par le lavage les principes les plus précieux, tels que les substances gomme-sucrées, albumine et mucilage qui, dans les pâtes naturelles, sont, pour ainsi dire, l'assaisonnement du gluten et en font tout le mérite par la saveur dont elles le couvrent.



tate, en effet, un accroissement extraordinaire dans l'importation des pâtes étrangères, qui de 106,112 kilog., chiffre de l'année 1828, s'élevait, en 1837, à 831,259 kil. Les fabriques de Nancy, de Lyon, de Paris faisaient d'ailleurs beaucoup mieux que les nôtres, et les primaient sur tous les marchés. La situation de cette industrie, à Clermont-Ferrand, devenait donc de plus en plus critique, et la fraude, sa plus mortelle ennemie, achevait de la ruiner et de la perdre.

C'est ainsi que toutes les entreprises, celles même qui doivent le plus tourner à l'honneur de notre espèce et fournir la meilleure preuve de la puissance de nos efforts ou des ressources de notre intelligence, subissent, à leur début, la rude épreuve des incertitudes, des mécomptes et des faux pas. Elles préludent à leur prospérité par la détresse, à leur triomphe par des revers. Tout ainsi, sur la terre, paie un tribut à la faiblesse de notre nature, tout s'enfante dans la douleur.

Tels aussi ont été chez nous les commencements de cette industrie. Elle languissait et dépérissait. Ce fut à l'école de ses souffrances que M. Magnin fit son apprentissage. Il puisa dans son passé de salutaires enseignements pour l'avenir, et, plein de foi dans les germes de vitalité qu'il aperçut en elle, il dévoua toutes les forces de son intelligence et de son énergie à la sortir de la profonde ornière où elle se mourait étouf-

fée, à rechercher et découvrir le meilleur mode de traitement voulu par la nature complexe, difficile et rebelle de ce blé rouge glacé, dont l'excellence se révélait à ses yeux par des qualités irrécusables qui le liaient invinciblement à la fabrication des pâtes, et devait un jour la faire prospérer et fleurir, en dotant l'Auvergne du tribut que la France payait pour elle à l'Italie.

Pour préparer cet avenir, M. Magnin n'a reculé devant aucun sacrifice : études, recherches, essais, voyages en Allemagne, en Italie, rien ne lui a coûté. Les manipulations diverses du travail des pâtes reçurent bientôt de lui tous les perfectionnements que comportaient la nature de nos blés et les vicissitudes atmosphériques inhérentes à notre climat. Les plus heureux succès couronnèrent ses efforts, et sa fabrication se signala par de tels progrès que déjà, en 1834, à l'exposition générale des produits de l'industrie française, ses pâtes occupèrent le premier rang et lui méritèrent la plus haute récompense décernée à cette branche d'industrie, une médaille de bronze. Depuis lors, les expositions générales qui ont eu lieu en 1839, 1844 et 1849, n'ont été pour M. Magnin, qu'une suite non interrompue de triomphes, où ses produits ont toujours été reconnus et proclamés supérieurs à tous autres, et où les premières médailles ne leur ont jamais failli.

A tous ces témoignages solennels consacrés par des



récompenses nationales, ajoutons encore les médailles nombreuses, les mentions honorables décernées à M. Magnin par la Société d'encouragement, l'Académie de l'industrie nationale, l'Institut des provinces, le Jury central du Puy-de-Dôme ; et, forts de l'autorité souveraine de tous les Jurys et Commissions qui ont prononcé sur le mérite de ses exhibitions, inscrivons dans nos annales le résumé de leurs jugements, cette conclusion glorieuse pour M. Magnin : que la France doit à sa persévérance, à son labeur, à son talent, d'avoir élevé chez elle la fabrication des pâtes au plus haut degré de perfection qu'elle ait nulle part atteint, d'avoir fait cesser en ce genre de produits son infériorité industrielle, et vaincu l'Italie, et enfin d'avoir contribué, pour la plus large part et au grand profit du travail national, à l'affranchir du lourd tribut qu'elle payait à l'étranger pour s'approvisionner d'une denrée dont le rôle dans l'alimentation publique devenait chaque jour plus important et de nécessité plus grande.

Maintenant, Messieurs, il nous reste à démontrer la situation prospère qu'a faite à notre département l'industrie des pâtes dans les conditions de perfectionnement et de progrès qui ont été l'œuvre de M. Magnin.

Cette industrie, avons-nous dit, succombait par l'ignorance et par la fraude ; M. Magnin la relève en résolvant pour elle tous les problèmes de manipulation

que soulevait la nature spéciale de notre blé rouge glacé et de notre climat.

Sous son habile main, la semoule de ce blé donne une pâte dont la nuance, la pureté, la finesse, la transparence effacent tout ce que Gênes et Naples nous avaient jusque-là apporté de plus beau : pâte dont la saveur exquise au goût n'appartient qu'à elle-même, et a quelque chose de ce parfum qui tient essentiellement au crû, qui caractérise particulièrement les productions d'essence privilégiée et les classe partout au premier rang.

En présence de ces résultats, que la consommation générale consacre par une préférence chaque jour plus marquée pour les produits de M. Magnin, l'industrie des pâtes s'émeut et accourt de toutes parts s'approvisionner chez nous d'une nature de blé dont la production est un des privilèges de cette terre promise qu'on appelle Limagne; et nous voyons en peu de temps surgir avec un essor rapide, et qui va s'accéléralant sans cesse, une industrie nouvelle, capitale pour notre département, la fabrication des semoules, fabrication vivace que nous voyons partout s'étendre, et qui repose sur la plus solide base, la mise en œuvre d'un grand produit de notre agriculture, de la variété de blé la plus productive sur nos terres les plus fortes, de ce blé rouge qui, par un jeu et tout à la fois un bienfait de la nature, se produit chez nous à l'état glacé, c'est-à-dire



dans les conditions les plus accomplies pour la perfection des produits d'une immense industrie; fabrication féconde qui substitue l'Auvergne à l'Italie, en faisant affluer chez elle et servir au développement de sa richesse et d'une industrie nationale, les capitaux morts autrefois, aujourd'hui vivants et productifs, que la France était dans la nécessité d'exporter pour son approvisionnement en pâtes d'Italie; qui fait revivre, sous une forme plus intègre et plus sûre, d'une manière plus fructueuse et plus durable, et sur une échelle non moins grande, le commerce de blé que nous faisions autrefois en farine, et que la fraude avait encore anéantie dans nos mains; fabrication dont l'expansion dans nos campagnes va tous les jours croissant, et réalise pleinement aujourd'hui le vœu depuis longtemps émis de la voir devenir une annexe aux meuneries si multipliées dans notre département, car son activité, en ce moment, s'exerce sur près de deux cent mille hectolitres, imprimant la vie et le mouvement à plus de quarante moulins, et disséminant sur nos populations agricoles le plus précieux des bienfaits, le travail, seul patrimoine du pauvre, et par cela même premier élément de la richesse et de la tranquillité publiques.

C'est donc à la renommée que les beaux produits de M. Magnin ont faite à nos blés rouges glacés, en faisant ressortir dans tout leur lustre les riches qua-

lités de leurs pâtes, que la grande fabrication des semoules doit chez nous son existence, et notre industrie agricole, le plus beau fleuron de sa couronne. Que le nom de M. Magnin y soit par nous gravé, car ce fleuron est pour notre pays un si grand bien, que nous n'imaginons pas qu'il puisse ambitionner une plus douce et plus noble récompense que celle de voir le souvenir de son nom étroitement lié par la reconnaissance publique à une création si utile.

Nous avons vu et examiné les belles pâtes que M. Magnin envoie à l'exposition universelle de Londres. Ces pâtes sont, par la grâce des formes, la variété des nuances, la pureté de la transparence et toutes les qualités qui dérivent de la perfection du travail, tout ce que M. Magnin a, jusqu'à ce jour, émis de plus beau, et l'excellence qui en fait le fond répond parfaitement à la forme. Ces pâtes vont figurer à Londres sous le nom de *Pâtes d'Auvergne* à côté de celles d'Italie. La comparaison qui en sera faite, le compte qui en sera rendu, mettront, nous n'en doutons pas, l'Auvergne en pleine possession de la renommée qui lui appartient en ce genre de produits, et permettront désormais à M. Magnin d'écouler, sous le nom de leur véritable provenance, ses pâtes que, jusqu'à ce jour, le commerce n'a livrées à la consommation qu'en leur attribuant une origine étrangère, car vous saurez, Messieurs, que la plupart des pâtes en belle qualité d'ori-

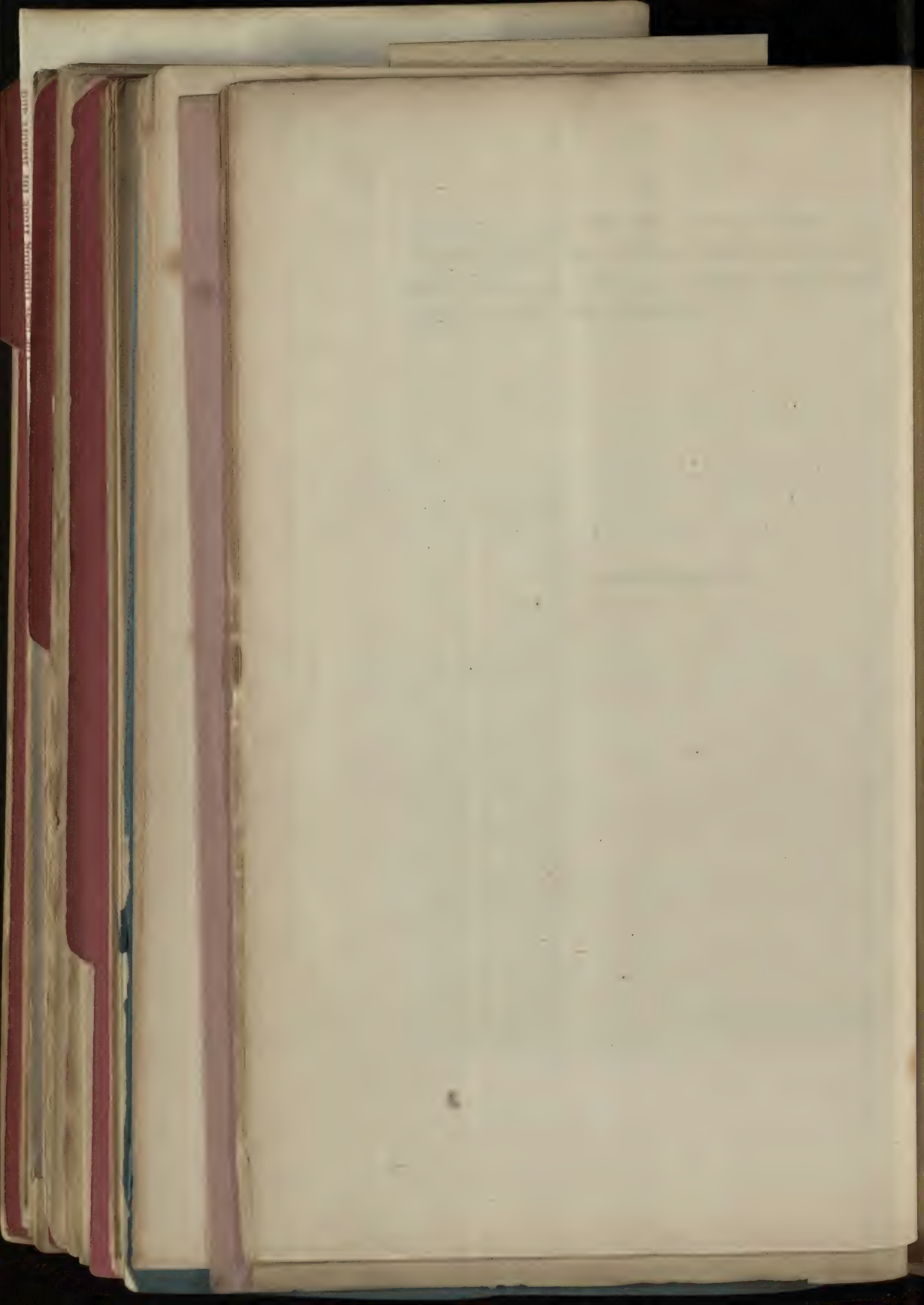


gine française que l'on vend à Paris et à Lyon, sont vendues comme pâtes de Naples, tandis que quelques pâtes d'Italie, qui n'ont pas les mêmes qualités, sont vendues comme pâtes d'Auvergne.













**BREVET D'INVENTION de 15 ans, S. G. du G.**



**LES PRODUITS DE CETTE FABRIQUE SONT SUPÉRIEURS A TOUS CEUX EXPOSÉS**  
**PATES FRANÇAISES**  
**MOULINS & FABRIQUE**  
**Rapport du Jury central, le Baron THIENARD, Pair de France, Président M. DARCET, Rapporteur.**

*de Semoule, Vermicelle, Macaroni, Etoiles & Graines de différentes formes.  
 Farines de légumes cuits, Pois, Lentille & Farine & Son de toutes qualités.*



**Siermont-S.**  
 (Pay-de-Dôme)

*Cette maison est la principale en France des pâtes de M. Magnin.*

Royal Starch Works,

Musselburgh, 1<sup>st</sup> August 1851.

Jury Department.

Mr. John Wilson

(Exhibition Building,

London.

Sir,

At your request we undertake remarks on our  
Products, exhibiting at the Great Exhibition of the Works of Industry  
of all Nations.

We have, Sir,

Your obedient servants,

D. & W. Miller

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No. 1. Household White Starch

Manufactured by us from the finest Home grown Wheat  
and requires boiling for Household purposes.

Price per Ton, £ 26. -

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No. 2. Bleachers Wheat Starch

Manufactured by us from the finest Home grown Wheat  
for Bleaching purposes only, and is free of Acid or Alkali  
and washed with pure water only.

Price in large quantities, per Ton, £ 24. -

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P.S. &



No 3 Royal Warrant Starch.

Manufactured by us from the finest Home grown Wheat  
and is used by Landladies and others for the getting up of  
Linen &c. as it withstands the humidity of the Atmosphere  
longer than any other starch we manufacture, it also requires  
no boiling, and is generally termed Patent Starch

Price per Ton £34 to 35.

No 4. Royal Blue Starch

Manufactured by us from the finest Home grown Wheat  
and requires to be boiled, used chiefly for Household  
purposes.

Price per Ton £28 to 30.

No 5. Sage Flour Starch

Manufactured by us from Sage Flour, and is found best  
adapted for dressing Faces and other light tatters.

Price in bulk per Ton £29 -  
and in Packages of 100 48 & 60 cwt, £26 -

No 6. Starch Thina's No 1.

Manufactured by us and chemically bleached, and is used  
by Confectioners, and also the price is much higher than the  
common classed Thina's, still Confectioners cannot be without it  
on account of its univalued purity of Colour and delicacy of  
finish.

Price in large quantities per Ton £ 18.-  
" in small quantities per Ton £ 19 to 22

It is generally termed Patent <sup>4</sup>Farina, it is made from sound Potatoes grown in the Lothians.

#### No. 1 Scotch <sup>4</sup>Farina No. 2.

Manufactured by us from sound Potatoes, grown in the Lothians and will be found to be exceedingly strong, and is washed only with pure water, no Acid or Alkali used for bleaching, and used by Gun Manufacturers, Paper Hangers, Confectioners, and Lower Town Manufacturers.

Price in large quantities per Ton £ 14 to 16

It is used also for Soups and Food. —  
It will be found also perfectly free of Sand, and is prized the more on that account.

#### No. 3 <sup>4</sup>Farina Food

Manufactured by us from the finest Largo Flour, imported from Glasgow, with no addition of Salt, and the finest White Sugar.



$Y(K)M$ 

ALEX. KEMP, Esq., F.R.S.E.

*Assistant Chemical Teacher in the University  
of Edinburgh.*

Gambary—I have subjected to Chemical Examination your sample of Pithlana sent to me, and consider it a very nutritious and pleasant article of diet, and well adapted for all those cases in which the use of food is not at present applied; and as it contains a considerable proportion of *gluten*, the vegetable principle which gives rise to the formation of the animal muscles, and other parts of the body, it may be used to produce strengthening nourishment in cases of debility. I can therefore recommend the Pithlana as being an economical food, and well suited for ship stores and military nurseries.

(Signed)  
ALEXANDER KERR.

### Receipt for Shapes

Which will be found Superior to Blanc Mange

Take two or three table-spoonfuls of Pithmas to two pints of sweet milk; moisten the Pithmas with a little of the milk, then add the remainder sweeten and season to taste, boil for three minutes, carefully stirring all the while; wet the mould and pour in the Pithmas: when cold, turn it out and ornament with preserves.

Receipt when used as Arrow Root

Dissolve one heaped tea-spoonful of Pitchin  
 with as little cold water or milk as possible, then  
 pour on as much boiling water or milk as is found  
 necessary, carefully stirring all the while; sweet-  
 en and season to taste.

20 - Plastic Tank

Pharosella & Co., Inc., an  
Orange Springs, Fla., firm, for  
Manufacturing



# PITHINA FOOD.

D. &amp; W. MILLER

Having for several years past had their attention directed to the difficulty of procuring GENUINE ARROW ROOT in quantities adequate to the general demand, have, after long and elaborate investigation, succeeded in producing a substitute equally nutritious, and, at the same time, much more economical than the article of food then known as ARROW ROOT. It is termed PITTHINA, and is the product of an East India plant, combined with other nutritious farinaceous substances, and having been analyzed by the most eminent chemists of the day, is also by the Medical Faculty, has been pronounced by them to be at once delicious and not nourishing article of diet.

D. & W. MILLER have much pleasure in stating that they are enabled to sell the PRIMA at a price that will readily bring it within the reach of all classes of the community.

Kemp, Esq., P.R.S.F., amply confirmatory of the above advertisement.

1793

MISSLEBURGI

FROM

W. GREGORY, Esq.

Professor of Chemistry, Edinburgh University.

was State-I have examined your Plithivian, which is an excellent article of diet, to be substituted for others of the same class. Children in the form of puddings, with milk, cream, or other nutritious food, the Plithivian can be made into the most palatable and nutritious article for the other many classes of articles seen for food. I suppose it contains a larger proportion of fat, and is, consequently, of great value as an element of diet, especially for the Invalids or Children of preparation-I have, for keeping up, by their combination with the oxygen taken into the lungs from the Plithivian tried to vary them, and go on. I have had the Plithivian tried in my own family, and it has proved very palatable and disagreeable. (Signed)

WILLIAM GREGORY.

THOMAS STEWART TRAILL, Esq.

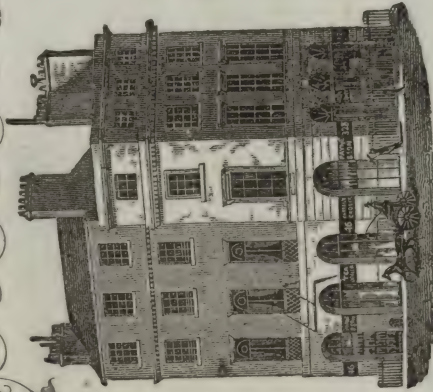
Professor of Medical Jurisprudence in the

Dr. Traill presents compliments to Messrs. D. & W. Miller, and has much pleasure in complying with their request, that he would state in writing his opinion of their *Farmaceutica Food*, called *Pitchina*. He mentions that the *Pitchina* is a

very valuable to our customers as a source of food, to be used instead of the flint for the Arrow Root in every case and more especially as it is so difficult to procure Arrow Root of a reasonable quality.—*See Patent.*

(Signed) T. STEWART TRAILL.





**PAYNE & SONS**

ROYAL POLYTECHNIC

**Foreign & Italian Warehouse,**

(Established 1810,)

**328, REGENT STREET, LONDON,**

NEARLY OPPOSITE the POLYTECHNIC INSTITUTION.

The following Articles, MANUFACTURED by PAYNE & SON, are strongly recommended, Specimens of which are deposited in the ROYAL EXHIBITION, Class 3, No. 22:—

## INDIAN CONDIMENTS.

PAYNE & SON have much pleasure in introducing these articles to the notice of the Public. They are the *only ones* in England in which the *TRUE* Indian flavours are thoroughly combined. The almost insurmountable difficulty of introducing the flavor of the *green* Fruits and Roots of India (as used by the native cooks) has been entirely overcome, and these articles will now compete with the best of India in flavour, and their retentive qualities are far superior, preserving their aromatic properties for many years.

"CURRY AS IN INDIA."—Messrs. Payne & Son, of 328, Regent Street, have recently succeeded in manufacturing an excellent Curry Powder; the almost insurmountable difficulty of introducing the flavour of the *green* fruits and roots of India has been entirely overcome. This condiment is the best we have ever met with in England, and must be esteemed a boon by those who have resided in the east. Messrs. Payne have also just introduced a piquant novelty which they call 'Indian Curry Sauce.' It is intended to supply in a measure the place of a curry for those who cannot succeed in making one. As a sauce it is a great improvement to, and peculiarly adapted for steaks, chops, game and hashes. Both kinds of condiments referred to deserve our unqualified recommendation."—*Allan's Indian Mail*, No. 135, Oct. 29th, 1849.

### BEST CURRY POWDER, OF TRUE INDIAN FLAVOUR,

At greatly Reduced Prices.  
In 1lb. Bottles, 3s. 6d.; 4lb. do. 2s. 3d.;  
4lb. do. 1s. 6d.; or 7lb. do. 21s.

### INDIAN CURRY PASTE,

In large Jars, 3s. 6d; smaller do. 2s. 3d.

### MULLIGATAWNY PASTE,

In large Jars, 3s. 6d; smaller do. 2s. 3d.

### REAL INDIAN CHUTNEY,

As prepared for the late King of Delhi.  
In Bottles, 1s. 6d. each.

### INDIAN CURRY SAUCE,

In fancy Bottles, 1s. 6d. each.

This novel and piquant Sauce, now introduced to the English Public for the first time, is peculiarly adapted for Steaks, Chops, Game, Fish, Cold Meats, Hash, &c. The addition of a little of this Sauce, in cases where a Curry cannot be procured, will prove to connoisseurs in Curry a valuable accompaniment.

The Sauce should be shaken before it is used.

### REAL MOGUL SAUCE,

Prepared from the original Indian Recipe.

In fancy Bottles, 1s. 6d. each.

This will be found a most delicious Sauce, possessing those flavours so much appreciated by persons who have lived in India.

PAYNE & CO.'S

### CONDIMENTS from CALCUTTA.

BENGAL CLUB CHUTNEY.

TAPONIAN SAUCE.

MANGOES, LIMES, and all other Comestibles.

\* \* In manufacturing the above Curry Powder, Sauce, &c. particular attention has been paid to their digestive and stimulating properties. The unsolicited recommendations Messrs. PAYNE & SON have received from many members of the Faculty, and various Noblemen and Gentlemen, are sufficient guarantee that these articles stand unequalled for their useful, nutritious and appetizing qualities.

**W.B. A LIBERAL ALLOWANCE ON EXPORT ORDERS.**

J. Waller, Printer, 75, Great Titchfield-street.

## RECEIPTS.

*Receipt for Making a Plain Curry.*—Put into a stewpan or saucepan some good dripping or butter, add a good-sized onion sliced, fry it brown, add one or two pounds of meat, one tablespoonful of PAYNE & SON'S CURRY POWDER, and one sour apple; pour in sufficient cold water to cover the meat, and simmer gently until the meat is done; take out a little of the liquor, add one spoonful more Curry Powder, a little arrowroot, the juice of half a lemon, and a little salt; pour it back into the pan, and stir it all well together for a few minutes; season it will be ready to serve. Meat that has been previously cooked merely requires to be heated through. When lemons cannot be procured, add a little sugar & vinegar.

*Receipt for a Meat, Chicken, or Rabbit Curry.*—Cut your Meat, Chicken, or Rabbit into pieces, dredge it with flour, and fry it a light brown colour in fresh butter, put it into a stewpan with a pint of good stock, and a tablespoonful of Curry Paste; slice three onions, fry them a light brown colour, and add them to the meat and gravy, with one or two apples cut into slices; let them simmer, take some of the liquor, the juice of half a lemon, a tablespoonful of Curry Paste, some arrowroot, a nob of butter, and a little salt, mix all well together, and return to the stewpan, boil for a few minutes, and it is ready to serve up. Some cooks pass the whole of the liquor through a sieve.

*To make Mulligatawney Soup.*—Cut a chicken in pieces, put it into the stewpan with a quart of water, parboil it with a table spoonful of Curry; slice an onion and a sour apple, fry them with a little butter, mix a little of the liquor from the stewpan, add the juice of a large lemon, a little salt, and stir gently till the chicken is well done; serve up with rice on another dish.

*To prepare Meat, Game, or Chicken Mulligatawney.*—Cut your Meat, Fowl, or Game into small pieces, add sufficient good stock to cover it, well mix with your gravy sufficient Mulligatawney Paste, and stew until together until the meat is done, then add a little salt and sufficient fried onions to flavour; pour off the fat, and together again with a little fish. N.B. About one table spoonful of Mulligatawney Paste to the pint of gravy is generally used, or more according to the palate.

*To make Mulligatawney Soup after ox-tail, turtle, or any other kind of food.*—Add a table spoonful, or more, according to taste, of Payne's Mulligatawney Paste; mix all well together in a stewpan, over a slow fire; when thoroughly warmed it will be quite ready for use.

*An Indian Receipt for Boiling Rice.*—Put the Rice into a large saucepan, with plenty of water, and allow it to boil for five minutes; then, if sufficiently cooked, strain it, and place the strainer over a pan of boiling water for half an hour, then cover it up, and place it near the fire to have it warm for serving up; sprinkle a little salt over it previous to sending it to table.

*Receipt for Native Curry.*—Half a cocker nut, a tea spoonful of rice, two almonds, one cashew nut, a dessert spoonful of Fenugreek seed, turmeric enough to colour, and these ingredients together as brown as you would coffee, and mix altogether.

has been paid to their digestive and stimulating properties of the Faculty, and various and nutritious and

May be had of Messrs. MACLEAN & CO., 27, Princes Street, Edinburgh; Messrs. ANDERSON & LAWRIE, 101, Princes Street, Edinburgh;

Messrs. BAXTER & CO., 137, Buchanan Street, Glasgow; and of all Italian Warehousemen throughout the kingdom.



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32 32

# GLENFIELD

# PATENT STARCH,

## NOW USED IN THE ROYAL LAUNDRY.

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THE Manufacturer of this Starch respectfully invites comparison with any other in the Market; and he rests assured that Laundresses, Housekeepers, and others giving it a fair trial, will find that it stands unrivalled for

### Cheapness, Strength, and Purity of Colour.

It imparts a fine Glossy Finish to the Goods, and retains that *Transparency* and *Stiffness*, which it has so pre-eminently attained, longer than any other Starch yet introduced. For the Dressing of LACES, LINENS, &c., nothing can equal it. It is particularly recommended for the Dressing of SHIRTS, as the easy ELASTICITY, which it retains even in Damp Weather, presents to the Wearer a pleasing and agreeable contrast to the stiff and uncomfortable appearance assumed by Linen when Dressed with *Crystallized*, or what is commonly called *Patent Starch*.

The steady increasing demand for this Article since it was introduced, Twelve years ago, justifies me in saying that this Starch is by far the Finest in the market.

When brought into notice first, it met with considerable opposition, because, unlike the Starch then in use, it was not *Crystallized*, but sold then as now in the form of a *Fine Powder*. This Opposition however soon disappeared, when it became known that in the process which *Patent Wheat Starch* has to undergo in Crystallization, it acquires certain properties very injurious to the Durability and Fine Appearance of LACES, LINENS, and other FINE GOODS, so that they soon become Discoloured, and the Fabrics are quite destroyed: whereas, the GLENFIELD PATENT DOUBLE-REFINED POWDER STARCH goes through a process so simple and efficient that it acquires no properties hurtful to either Texture or appearance of the Goods; but on the contrary, produces a Fine Clear Flexible Finish. It requires no Boiling, is perfectly free from all Impurities, and is warranted not to adhere to the Iron.

In many parts of England Blue Starch alone is used; this Starch being made pure may be either used in its present *clear* state, or Blued to any depth required, by adding more or less of the *Glenfield Soluble Blue*, which may be had of the same parties as the Starch. (*See Advertisement on other side.*)

This Blue, being exceedingly Soluble and Bright in Colour, is admirably adapted for this, or Washing purposes generally. A very small quantity of the Blue will suffice to bring the Starch to a deep blue shade.

### TESTIMONIALS.

The following Testimonials from the Laundress to Her Majesty, the Nobility, and others, are adduced to show the estimation in which the Glenfield Patent Starch is held by those who are in the habit of using it regularly:—

#### Testimonial from the

LAUNDRESS of HER MAJESTY'S ROYAL LAUNDRY, Richmond, Surrey.

Mr. WOTHERSPOON, 40, Dunlop Street, Glasgow.

The Glenfield Patent Powder Starch has now been Used for some time in that Department of the Royal Laundry where all the Finest Goods are Finished for Her Majesty, Prince Albert, and the Royal Family, and I have much pleasure in informing you that it has given the highest satisfaction.

M. WEIGH,

Laundress to Her Majesty.

Royal Laundry, Richmond, near London, 15th May, 1851.



**Testimonial from the Lady Mayoress of London.**

The Lady Mayoress begs to thank Messrs. Pantin & Turner for a box of Glenfield Patent Double-Refined Powder Starch, manufactured by Mr. Wotherspoon of Glasgow. The Laundress has reported the Starch to be of very Superior Quality, and the Lady Mayoress will have much pleasure in recommending it.  
Mansion House, 31st July, 1849.

**Copy of Testimonial from the Lady of W. Chambers, Esq. of Glenormiston, one of the Publishers of "Chambers's Edinburgh Journal."**

GLENORMISTON, December 25, 1850.

Mrs. Chambers offers best thanks to Mr. Wotherspoon for a package of Glenfield Patent Starch; and begs to say that her Laundress, after Twelve Months experience, considers this species of Starch by far the best she has ever used.

**Testimonial from the Laundress of the Countess of Eglinton.**

I have much pleasure in bearing testimony to the Superior Qualities of the Glenfield Patent Double-Refined Powder Starch, which for Strength, Purity of Colour, and in giving a Clear, Elastic, and Beautiful Finish to Laces and Linens, I have never seen equalled.

Eglinton Castle, July, 1849.

(Signed)

ELIZABETH REID,  
Laundress to the Countess of Eglinton.

**Testimonial from the Laundress of the Marchioness of Breadalbane.**

I have now used the Glenfield Patent Powder Starch for some time, and find the Quality superior to any I have ever tried. For giving a transparent clear elastic finish to Laces, Linens, &c., it cannot be surpassed: I intend using no other.

(Signed)

PHILLAS FELTON,  
Laundress to the Marchioness of Breadalbane.

Tynmouth Castle, 1st September, 1849.

See also Testimonials from the Matron of that excellent Institution, the "Manchester Female Asylum." The well known superior manner in which Washing and Finishing is done at this Establishment enhances the value of this Testimonial. Also, from Laundress to the Countess of Dartmouth, &c.

PLEASE ASK FOR THE

**GLENFIELD PATENT DOUBLE-REFINED POWDER STARCH,**  
In Packets of 1d., 2d., 4d., and 8d. each, with full Directions for use.

STONE AND INDIGO BLUE SUPERSEDED!

**GLENFIELD ROYAL PATENT SOLUBLE BLUE,**  
Warranted to Dissolve Freely in Warm Water, and not to Stain the Clothes.

THIS truly elegant Preparation, when mixed with Water, instantly forms a Beautiful Transparent LIQUID BLUE, perfectly free from all those Earthy and Metallic Mixtures of which the Common Blues are possessed, not even excepting INDIGO.

For giving a Good Colour to LINENS, WOOLLENS, &c., it is unsurpassed. Laundresses and others, who are in the habit of getting up Fine Linens, and especially after they have been Injured in Colour by Bad Washing and Drying, will find this Article of great Use in restoring that Pure Whiteness which is so much desired.

Laundresses and Houskeepers are most respectfully solicited to make One Trial of these Articles, which will be quite sufficient to satisfy any one of their superiority.

May be had in 1d., 2d., 4d., and 8d., Packets, with full Printed Directions for Using, of nearly all respectable Chandlers, Grocers, Druggists, Oil and Colourmen, and Italian Warehouses, in the United Kingdom.

Manufactured by **ROBERT WOTHERSPOON, 40, Dunlop Street, Glasgow.**

**IMPORTANT CAUTION.**—From the immense demand which has arisen for the Glenfield Patent Powder Starch, wherever it has been introduced, many unprincipled parties have imitated the Label and Packages so very closely as scarcely to be distinguished from the original. I beg to caution the Public to see that the Manufacturer's name, Robert Wotherspoon, 40, Dunlop Street, is printed at the bottom of each Label, as none without his Signature is genuine.

**Wholesale Agents,**

**Messrs. PANTIN & TURNER,**

**88, West Smithfield,**

**LONDON.**

RAW MATERIALS.

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CLASS IV.

VEGETABLE AND ANIMAL SUBSTANCES USED IN  
MANUFACTURES.



1849.

**CLASS IV. No. 62, SOUTH WEST GALLERY.**

ORDERS PROMPTLY EXECUTED

FOR

**BARKER AND COMPANY'S**

*(Late T. Barker and Co.,)*

**EXHIBITION PERFUMERY,**

**AT WHOLESALE PRICES.**

**EAU D'EXPOSITION A LONDRES, 1851,**

*composed expressly for the Exhibition of All Nations, by the Proprietors and Exhibitors. A sample may be had of the PERFUME FOUNTAIN, Class IV., as above, and one trial will prove its vast superiority over the best Eau de Cologne of Foreign Manufacture, although at less than one half the price.*

Sold in *Illustrated Boxes*, containing  $\frac{1}{2}$  doz. and  $\frac{1}{4}$  doz. Bottles, at 9s. 6d. and 5s. per box, for cash.

**THE QUEEN'S OWN BOUQUET,**

An entirely new Perfume, also composed expressly for the Exhibition.

**BOUQUETS OF ALL NATIONS,**

using FIFTEEN entirely NEW and DISTINCT varieties, also composed expressly for the Exhibition, by the Exhibitors of the MOST RECHERCHE Perfumes peculiar to each NATION and CLIMATE, viz.—

Bouquet de Grand Bretagne.  
" d'Irlande.  
" des Etats unis.  
" de Hanover.  
" de l'Empire Celeste.

Bouquet de France.  
" de l'Espagne.  
" de Belge.  
" de Saxe.  
" de Hollande.

Bouquet de Russie.  
" de Autriche.  
" de Prusse.  
" de Turcy.  
" de Californi.

The above Bouquets are sold in boxes, each containing 6 bottles, assorted, at 12s. per box.

*article of British and Foreign Perfumery and essential Oils, of the best quality, at Wholesale Prices, may be had at the Warehouse,*

**1, BREAMS BUILDINGS, CHANCERY LANE.**

N.B.—Sole Agents for

**LIPSCOMBE'S PATENT SELF-ACTING PERFUME FOUNTAINS,**

As Exhibited by Barker and Co.—Prices from £4 14s. 6d.

PRICES MAY BE ASCERTAINED OF THE ATTENDANT AT THE EXHIBITION.

Orders by Post sent to any part of Town or Country.





TRADE LIST

BARKER & CO.'S

PERFUMERY,

ESSENTIAL OILS, &c.



MANUFACTORY AND WHOLESALE WAREHOUSE,

BREAM'S BUILDINGS,

CHANCERY LANE, LONDON.

S,

AGE,

Y.

TO

and

DISTANCES,  
*Reports on*

STATION

FOR HYDRAULIC APPARATUS AND TANKS,

FOR THE EXPEDITIOUS PREPARATION OF MATERIALS,

MILLWALL, POPLAR, NEARLY OPPOSITE GREENWICH.

OFFICE, 53, KING WILLIAM STREET,  
LONDON BRIDGE.



1849

1849

1849

1849

1849

1849



**TRADE LIST**  
OF  
**BARKER AND CO.'S**  
**EXHIBITION PERFUMERY,**  
ESSENTIAL OILS, &c.,  
AS EXHIBITED  
WITH THE PERFUME FOUNTAIN,  
AT THE CRYSTAL PALACE, HYDE PARK,  
CLASS IV., No. 62.  
1851.

MANUFACTORY AND WAREHOUSE,  
No. 1, BREAM'S BUILDINGS,  
CHANCERY LANE, LONDON.

PRINTED BY JOHN KING, 120, FLEET-STREET, LONDON.

STATION  
FOR HYDRAULIC APPARATUS AND TANKS,  
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LONDON BRIDGE.



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# TRADE LIST

OF

MESSRS. BARKER AND CO.'S PERFUMERY, &c.

EXHIBITORS

GREAT EXHIBITION BUILDING HYDE PARK,

CLASS 4, No. 62, SOUTH-WEST GALLERY.

BARKER AND Co.'s EAU D' EX-  
POSITION A LONDRES, 1851,  
of British Manufacture, as exhibited  
at the perfume Fountain, South-West  
Gallery, for its superiority over the  
best Eau de Cologne of Foreign  
Manufacture, although at less than  
one half the price.

Wholesale. Single retail.

|                                                                                                                                   |    |    |     |
|-----------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| In handsome illustrated Boxes, con-<br>taining six Bottles (usual Eau de<br>Cologne size,) per Box                                | 9  | 6  |     |
| Ditto containing three Bottles,                                                                                                   | 5  | 0  |     |
| The same in quantities of not less than<br>twelve dozen at per dozen                                                              | 15 | 0  | 2 6 |
| The same for supplying Lipscombe's<br>Patent Fountain the same as exhibi-<br>ted by Barker and Co., sole agents.<br>at per Gallon | 1  | 15 | 0   |

## STATION

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OFFICE, 53, KING WILLIAM STREET,  
LONDON BRIDGE.



## 4 TRADE LIST OF BARKER AND CO.'S PERFUMER

## PERFUMES FOR THE HANDKERCHIEF.

## BOUQUETS OF ALL NATIONS.

Comprising FIFTEEN entirely new and distinct varieties of the most recherche Perfumes peculiar to each nation and climate, viz:—

|                           |                  |
|---------------------------|------------------|
| Bouquet de Grand Bretagne | Bouquet d'Irland |
| " des Etats Unis          | " de Hanover     |
| " de l'Empire Celeste     | " de France      |
| " de l'Espagne            | " de Belge       |
| " de Holland              | " de Saxe        |
| " de Russie               | " de Autriche    |
| " de Prussie              | " de Turcy       |
| " de Californie           |                  |

The above Bouquets, in handsome illustrated boxes, with embossed labels, illustrative of the different nations, containing six bottles.

|                                                       |              | Wholesale. | Single |
|-------------------------------------------------------|--------------|------------|--------|
| 1½ oz. assorted                                       | per box      | 12         | 0      |
| The same in quantities of not less than twelve boxes. | at per box   | 10         | 0      |
| Ditto not in boxes                                    | at per dozen | 18         | 0      |
| Ditto in stoppered bottles 1½ oz                      | "            | 1          | 1      |
| Ditto " " 2½ oz                                       | "            | 1          | 12     |
| Ditto " " 5 oz                                        | "            | 2          | 16     |
| Ditto " " 10 oz                                       | "            | 5          | 5      |

## THE QUEEN'S OWN BOUQUET.

An entirely new Perfume, also composed expressly for the Exhibition.

Same prices as the above Bouquets.

|                   |                       |
|-------------------|-----------------------|
| Bouquet Victoria  | Bouquet De Mignonette |
| " Prince Albert   | " De Esterhazy        |
| " Prince of Wales | " Du Jockey Club      |
| " Princess Alice  | " Royal Highland      |
| " Duke of York    | " De Daphne           |
| " Queen Dowager   | " Pres Fleuris        |

|               |   |               |
|---------------|---|---------------|
| Ibrahim Pacha | „ | De Sontag     |
| De l'Reine    | „ | Du Printems   |
| De Caroline   | „ | Du Matin      |
| D'Arabie      | „ | Des Soirees   |
| Jenny Lind    | „ | Patchonly     |
| Cravelli      | „ | Royal Essence |

Wholesale. Single retail.

|                                                                        |          |    |   |    |
|------------------------------------------------------------------------|----------|----|---|----|
| The above Bouquets as per List                                         | 12       | 0  |   |    |
| Ditto second quality                                                   | 9        | 0  |   |    |
| Small bottles at per dozen                                             | 7        | 0  | 1 | 0  |
| Ditto round ditto, with stoppers, 1 1/4 oz                             | 18       | 0  | 2 | 6  |
| Ditto ditto. 2 1/2 oz                                                  | 1        | 10 | 0 | 4  |
| Ditto ditto. 5 oz                                                      | 2        | 14 | 0 | 7  |
| Ditto ditto, 10 oz                                                     | 5        | 0  | 0 | 14 |
| The same in handsome cut bottles from 16s. per dozen, and upwards.     |          |    |   |    |
| Oil Yabani, or Extract of Wild Roses, an eastern Perfume much admired, | 1 1/4 oz | 15 | 0 | 2  |
|                                                                        |          |    |   | 0  |

# LAVENDER WATER, &c.

|                                    |    |    |   |   |
|------------------------------------|----|----|---|---|
| Double distilled from the Flowers: |    |    |   |   |
| In bottles 1/2 oz.                 | 4  | 0  | 0 | 6 |
| Ditto 1 oz.                        | 8  | 0  | 1 | 0 |
| Ditto 2 oz.                        | 11 | 6  | 1 | 6 |
| Ditto 1/4 pt.                      | 16 | 0  | 2 | 0 |
| Ditto 1/2 pt.                      | 1  | 3  | 0 | 3 |
| Ditto 1 pt.                        | 2  | 6  | 0 | 6 |
| Triple distilled 1/4 pt.           | 18 | 0  | 2 | 6 |
| Ditto 1/2 pt.                      | 1  | 10 | 0 | 4 |
| Ditto 1 pt.                        | 2  | 18 | 0 | 7 |

# EXTRAITS TRIPLES.

|               |           |            |
|---------------|-----------|------------|
| Moss Rose     | Tubereuse | Miel       |
| Heur d'Orange | Suave     | Mignardise |
| Sceda         | Marchale  | Patchouly  |

# STATION

FOR HYDRAULIC APPARATUS AND TANKS,

FOR THE EXPEDITIOUS PREPARATION OF MATERIALS,

MILLWALL, POPLAR, NEARLY OPPOSITE GREENWICH.

OFFICE, 53, KING WILLIAM STREET,  
LONDON BRIDGE.

S,

AGE,

TO

and

STANCES,  
Reports on



## 6 TRADE LIST OF BARKER AND CO'S PERFUMERY

EXTRAITS TRIPLES *continued.*

|                   |                 |                |
|-------------------|-----------------|----------------|
| Millefleurs       | Girofle         | Eglantine      |
| Orange d'Portugal | Heliotrope      | Lilas          |
| Ellett            | Moussoline      | Aubepine       |
| Cassia            | Pois de Senteur | Geranium Rose  |
| Chypre            | Vanille         | Miel Ambre     |
| Fluer de Mai      | Musc            | Rose Muscade   |
| Cedrat            | Murquet         | Clematis       |
| Bergamotte        | Verveine        | Citron Blanche |
| Magnolia          | Jasmin          |                |
| Rose              | Violette        |                |

|                                  |         | Wholesale. | Single ret. |
|----------------------------------|---------|------------|-------------|
| The above, in Boxes of one dozen | bottles | 7 0        | 1 0         |
| Round bottles with stoppers      | 1½ oz.  | 18 0       | 2 0         |
| Ditto                            | 2½ oz.  | 1 10 0     | 4 0         |
| Ditto                            | 5 oz.   | 2 14 0     | 7 0         |
| Ditto                            | 10 oz.  | 5 0 0      | 14 0        |

## FRENCH EXTRACTS.

|                     |         |      |
|---------------------|---------|------|
| Genuine as imported | per lb. | 13 0 |
| Second quality      |         | 9 0  |

## EAUX DOUBLES.

Same Perfumes as the Extraits Triples.

|                                                                               |         |      |     |
|-------------------------------------------------------------------------------|---------|------|-----|
| In Bottles                                                                    | 2 oz.   | 18 0 | 2 0 |
| Ditto                                                                         | ¼ pt. 1 | 4 0  | 3 0 |
| Extract of Spring Flowers, a delicate and grateful Perfume of Myrtle Flowers. |         |      |     |
| Eau de Paris                                                                  |         |      |     |
| Eau Suave                                                                     |         |      |     |
| Eau Mignonne                                                                  |         |      |     |
| Eau De Toilette                                                               |         |      |     |
| The above in bottles                                                          | 2 oz.   | 18 0 |     |
|                                                                               | ¼ pt. 1 | 4 0  | 3 0 |
|                                                                               | ½ pt. 1 | 18 0 | 5 0 |

EAUX DOUBLES *continued.*

Wholesale. Single retail.

ences, assorted Perfumes.

|            |                   |    |   |   |   |
|------------|-------------------|----|---|---|---|
| In Bottles | 3 dr.             | 3  | 6 | 0 | 6 |
|            | 1 oz.             | 7  | 0 | 1 | 0 |
|            | 2 oz.             | 18 | 0 | 2 | 6 |
|            | $\frac{1}{4}$ pt. | 1  | 4 | 0 | 3 |
|            |                   |    |   |   | 6 |

The above are sent out in boxes of 3, 6, or 12.

PERFUMED FOUNTAINS.

A new invention very convenient for travelling or carrying about, filled with the best Perfumes and covered with richly embossed Satin Papers,

|                                    |    |   |   |   |
|------------------------------------|----|---|---|---|
|                                    | 7  | 0 | 1 | 0 |
| Ditto                              | 12 | 0 | 1 | 6 |
| Ditto                              | 15 | 0 | 2 | 0 |
| Ditto                              | 1  | 3 | 0 | 3 |
|                                    |    |   |   | 0 |
| Ditto with second quality perfumes | 3  | 6 | 0 | 6 |
| Ditto                              | 7  | 0 | 1 | 0 |
| Ditto                              | 11 | 0 | 1 | 6 |
| Ditto                              | 14 | 0 | 2 | 6 |

GENUINE EAU DE COLOGNE.

(FROM THE MOST APPROVED MAKERS.)

A very Superior Article, highly recommended in long or short bottles, prepared at Cologne expressly for

|                       |    |   |   |   |
|-----------------------|----|---|---|---|
| Barker and Co.        | 18 | 0 | 2 | 6 |
| Ditto smaller bottles | 10 | 6 | 1 | 3 |

Eau de Cologne, de Jean Marie Farina, warranted Genuine, (per dozen,) nett Cash

|  |   |    |   |   |   |
|--|---|----|---|---|---|
|  | 1 | 10 | 0 | 3 | 6 |
|--|---|----|---|---|---|

The same in bond, in cases of not less than 12 dozen, (per doz.), nett Cash

|        |    |   |   |   |
|--------|----|---|---|---|
| French | 14 | 0 |   |   |
| French | 12 | 0 | 1 | 6 |

toilet Vinegar, in cases of 12 dozen, at per dozen

|  |    |   |   |   |
|--|----|---|---|---|
|  | 18 | 0 | 2 | 6 |
|--|----|---|---|---|

STATION

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OFFICE, 53, KING WILLIAM STREET,

LONDON BRIDGE.



## 8 TRADE LIST OF BARKER AND CO.'S PERFUMERY

## ARTICLES FOR PERFUMING APARTMENTS.

|                                                            | Wholesale. | Retail single. |
|------------------------------------------------------------|------------|----------------|
| Eau a Bruler, (after Lubin's celebrated recipe,) per dozen | 1 8 0      | 4 0            |
| Pastils du Serail, in boxes with handsome gold Labels      | 3 6        | 0 0            |
| Ditto                                                      | 7 6        | 1 0            |
| Ditto                                                      | 12 0       | 1 0            |
| Ditto per lb.                                              | 16 0       |                |
| Ditto, common                                              | 8 0        |                |

## SACHETS.

## FOR PERFUMING DRAWERS, ETC.

|                                                                         |       |     |
|-------------------------------------------------------------------------|-------|-----|
| Sachets Parfumes, assorted in rich embossed wrappers                    | 7 6   | 1 0 |
| Ditto with highly finished coloured drawings                            | 7 6   | 1 0 |
| Ditto ditto                                                             | 12 0  | 1 0 |
| Ditto ditto                                                             | 18 0  | 2 0 |
| Peaux d'Espagne, of a beautiful and lasting fragrance                   | 1 4 0 | 3 6 |
| Glove and Handkerchief Sachets of various patterns and prices.          |       |     |
| A great variety of Sachets got up in the newest and most elegant style. |       |     |
| Sultanas, Parfumes for Gloves, Handkerchiefs, &c.,                      |       |     |
| Perfumed Powders, various, per lb.                                      | 10 0  |     |

## FOR REVIVING DEPRESSED SPIRITS.

|                                                         |                               |      |
|---------------------------------------------------------|-------------------------------|------|
| Crystallized aromatic Vinegar, a very superior article. |                               |      |
| A l'Rose, in bottles                                    | 7 6                           | 1 0  |
| A l'Lavande                                             | } in cut ditto and stoppered, |      |
| Au Camphire                                             |                               | 18 0 |
| A l'Amande                                              |                               |      |
| Ditto per lb.                                           |                               | 16 0 |

FOR REVIVING DEPRESSED SPIRITS *continued.*

|                                          | Wholesale. | Retail single. |
|------------------------------------------|------------|----------------|
| Inexhaustible smelling Salts, plain bot. | 7 6        | 1 0            |
| cut ditto                                | 18 0       | 2 6            |
| Preston Salts                            | 7 6        | 1 0            |

WINDSOR SOAPS.

|                                                                                                      |      |     |
|------------------------------------------------------------------------------------------------------|------|-----|
| Musk Scented old Brown Windsor Soap, a very Superior article, in packets of three Squares, per dozen | 8 0  | 1 0 |
| Ditto ditto, 6 squares                                                                               | 16 0 | 2 0 |
| Emollient Brown Windsor Soap, first quality, per lb.                                                 | 1 6  | 2 6 |
| Emollient Brown Windsor Soap second quality, per lb.                                                 | 1 2  | 2 0 |
| Ditto third ditto per lb.                                                                            | 1 0  | 1 3 |
| Ditto improved White Windsor, per lb.                                                                | 1 0  | 1 6 |
| Ditto ditto per lb.                                                                                  | 1 4  | 2 0 |

FANCY SOAPS.

|                                                               |             |          |
|---------------------------------------------------------------|-------------|----------|
| Almond                                                        | Mignardises | Rose     |
| Fleur d'Mai                                                   | Orange      | Œillet   |
| Verbena                                                       | Marechale   | Geranium |
| Monssoline                                                    | Moss Rose   | Miel     |
| Magnolia                                                      | Camphor     | &c., &c. |
| The above in elegant embossed wrappers, per dozen             | 4 0         | 0 6      |
| Ditto large as per above List                                 | 8 0         | 1 0      |
| Honey Toilet Soap in Boxes of six dozen, at per dozen         | 2 9         | 0 4      |
| Honey and Sand Tablets                                        | 4 0         | 0 6      |
| Sand Balls and Tablets                                        | 7 0         | 1 0      |
| Oval Tablets, brown, white, and pink                          | 3 6         | 0 6      |
| Palm Soap, Perfumed, oval or square                           | 6 0         | 1 0      |
| Almond, Rose, or Vegetable ditto, in packets of three squares | 8 0         | 1 0      |

STATION

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LONDON BRIDGE.



## 10 TRADE LIST OF BARKER AND CO.'S PERFUMERY

## SHAVING SOAPS.

|                                                                                                   | Wholesale | Retail single |
|---------------------------------------------------------------------------------------------------|-----------|---------------|
| Barker and Co.'s newly-discovered Shaving Soap, producing a lather which does not dry on the face | 4 0       | 0             |
| Ditto Cream of Almonds, an article of great celebrity, in pots, 1 oz. per doz.                    | 8 0       | 1 0           |
| Ditto 2 oz. per do.                                                                               | 12 0      | 1 0           |
| Creme d' Amandes Ameres, a French preparation in pots, with handsome embossed labels              | 12 0      | 2 0           |
| Ditto Scented, per lb.                                                                            | 3 0       |               |
| Ditto plain per lb.                                                                               | 2 6       |               |
| Naples Soap, as imported, or perfumed in pots 1 oz. per doz.                                      | 8 0       | 1 0           |
| Ditto 2 oz. per do.                                                                               | 12 0      | 1 0           |
| Ditto 2 oz. per do.                                                                               | 18 0      | 2 0           |
| Ditto plain per lb.                                                                               | 4 0       |               |
| Ditto scented per lb.                                                                             | 5 0       |               |
| Parisian Shaving Cakes, Almond per doz.                                                           | 8 0       | 1 0           |
| Ditto, aromatique                                                                                 | 12 0      | 1 0           |
| Honey Shaving Cakes, round or square                                                              | 4 0       | 0 0           |
| Brown, white, and pink Shaving Cakes                                                              | 4 0       | 0 0           |
| Ditto                                                                                             | 6 0       | 0 0           |
| Ditto                                                                                             | 8 0       | 1 0           |

## ARTICLES FOR THE HAIR.

|                                                |           |      |     |
|------------------------------------------------|-----------|------|-----|
| The Sicilian Cream, a new and superior article | per dozen | 8 0  | 1 0 |
| Ditto                                          | 2 oz.     | 12 0 | 1 0 |
| Ditto                                          | 3 oz.     | 18 0 | 2 0 |
| Ditto                                          | 4 oz.     | 16 0 | 5 0 |
| Elaine Philocombe for nourishing the Hair      |           | 8 0  | 1 0 |
| Amandoline for fixing and smoothing ditto      |           | 12 0 | 1 0 |
| Marrow Oil                                     |           | 18 0 | 2 0 |

ARTICLES FOR THE HAIR *continued.*

|                                                                                                                                     |                              | Wholesale. | Single retail |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------|---------------|
| Crystallized Castor Oil                                                                                                             |                              | 8 0        | 1 0           |
| Ditto                                                                                                                               |                              | 12 0       | 1 6           |
| Ditto, stoppered bottles,                                                                                                           | 2 oz.                        | 18 0       | 2 0           |
| Ditto, ditto,                                                                                                                       | 4 oz.                        | 1 16 0     | 5 0           |
| Ditto Cream of Honey, stoppered                                                                                                     |                              |            |               |
| bottles                                                                                                                             | 2 oz.                        | 18 0       | 2 6           |
| Ditto ditto                                                                                                                         | 4 oz.                        | 1 16 0     | 5 0           |
| Circassian Cream                                                                                                                    | } in pots                    | 3 6        | 0 6           |
| Genuine Bear's Grease                                                                                                               |                              | 8 0        | 1 0           |
| Genuine Marrow Oil                                                                                                                  | } in bottles                 | 8 0        | 1 0           |
| French Pomade                                                                                                                       |                              |            |               |
| Pomade a la Moussoline                                                                                                              | } in $\frac{1}{2}$ lb. pots, |            |               |
| " Reseda                                                                                                                            |                              |            |               |
| " Blanche a la Cassie                                                                                                               |                              |            |               |
| (premiere qualitie)                                                                                                                 | per dozen                    | 1 16 0     | 7 6           |
| Roll ditto                                                                                                                          |                              | 4 0        | 0 6           |
| Ditto superior                                                                                                                      |                              | 8 0        | 1 0           |
| Hair Oils and French Bandoline, and every kind of Pomatum, in showy pots and bottles, at 2s. 6d., 4s., 6s., 7s. and 8s., per dozen. |                              |            |               |

HAIR DYES.

|                                                                                                                                                                  |   |      |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------|-----|
| The Sicilian Liquid Hair Dye, a new discovery, which dyes the Hair instantaneously, and gives it a natural shade, (in boxes containing 2 bottles and 2 brushes,) |   |      |     |
|                                                                                                                                                                  | 1 | 12 0 | 5 6 |
| Grecian Hair Dye                                                                                                                                                 |   | 16 0 | 2 6 |
| Ditto                                                                                                                                                            | 1 | 8 0  | 5 0 |
| Eau de l'Chine; a liquid Hair Dye                                                                                                                                | 1 | 10 0 | 5 0 |
| Cosmetiques of all colours highly perfumed and carefully prepared                                                                                                |   | 8 0  | 1 0 |
|                                                                                                                                                                  |   | 12 0 | 1 6 |
| French Cosmetiques                                                                                                                                               |   | 3 6  | 0 6 |
|                                                                                                                                                                  |   | 7 0  | 1 0 |
| French Cire a Moustaches, for curling the Whiskers and Moustachios                                                                                               |   |      |     |
|                                                                                                                                                                  |   | 6 0  | 1 0 |

STATION

FOR HYDRAULIC APPARATUS AND TANKS,

FOR THE EXPEDITIOUS PREPARATION OF MATERIALS,

MILLWALL, POPLAR, NEARLY OPPOSITE GREENWICH.

OFFICE, 53, KING WILLIAM STREET,

LONDON BRIDGE.



## 12 TRADE LIST OF BARKER AND CO'S PERFUMERY.

## HAIR WASHES.

|                                                                                                |                   | Wholesale. | Single retail. |
|------------------------------------------------------------------------------------------------|-------------------|------------|----------------|
| Parisian Hair Wash, unequalled for<br>cleaning the Hair and removing<br>the Scurf, (per dozen) | $\frac{1}{2}$ pt. | 18 0       | 2              |
| Quinine Hair Wash                                                                              | pint              | 1 4 0      | 3 6            |
| Vegetable Extract for curling the Hair<br>and giving it a most delectable<br>appearance        | $\frac{1}{4}$ pt. | 1 4 0      | 3 6            |
| Extract of Roses in bottles,                                                                   | $\frac{1}{2}$ pt. | 1 18 0     | 5 0            |
| Honey Water, ditto                                                                             | pint              | 3 16 0     | 10 0           |
| Scented Hair Powder,                                                                           | per dozen         | 12 0       | 1 6            |
| Plain ditto                                                                                    |                   | 10 6       | 1 3            |
| Depilatory for removing superfluous<br>Hair                                                    |                   | 1 0 0      | 3 6            |
| Poudre Subtile                                                                                 |                   | 1 4 0      | 3 6            |

## ARTICLES FOR THE COMPLEXION.

|                                                                                                                                                            |                   |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|
| Creme de Paris, an entirely new and<br>elegant Cosmetique, very superior for<br>whitening the skin and beautifying<br>the complexion, in bottles, per doz. | 1 4 0             | 4 0      |
| Milk of Almonds                                                                                                                                            |                   |          |
| Milk of Roses                                                                                                                                              |                   |          |
| Superior Cold Cream in pots                                                                                                                                | $\frac{1}{2}$ oz. | 4 0 0 6  |
| Blanc de Perle in packets                                                                                                                                  | 1 -               | 8 0 1 0  |
| Mother o' Pearl, white in boxes                                                                                                                            | 2 -               | 12 0 1 6 |
| or pots                                                                                                                                                    | 4 -               | 16 0 2 6 |
| Rouge de Theatre in pots, per doz.                                                                                                                         |                   | 8 0 1 0  |
| „ Vegetal                                                                                                                                                  |                   | 12 0 1 6 |
| „ des Indes                                                                                                                                                |                   | 18 0 2 6 |
| „ de Ville in china pots                                                                                                                                   | 1 4 0             | 3 6      |
| „ Superfine ditto (gilt)                                                                                                                                   | 1 16 0            | 5 0      |
| „ Ditto ditto (painted)                                                                                                                                    | 2 8 0             | 7 1      |

ARTICLES FOR THE COMPLEXION *continued.*

|                                                               | Wholesale. |      | Single retail. |   |
|---------------------------------------------------------------|------------|------|----------------|---|
| Rouge de Theatre, Extra fine, in china pots, (richly painted) | 4          | 16 0 | 21             | 0 |
| " In packets                                                  |            | 4 0  | 0              | 6 |
| " Ditto                                                       |            | 8 0  | 1              | 0 |
| Liqueur de Rouge, extracts from flowers                       |            | 8 0  | 1              | 0 |
| Ditto                                                         |            | 12 0 | 1              | 6 |
| Ditto                                                         |            | 18 0 | 2              | 6 |
| Otto de Rose lip Salve, painted china pots                    |            | 8 0  | 1              | 0 |
| Ditto ditto plain                                             |            | 4 0  | 0              | 6 |
| Pistachio Nut Skin and Complexion Powder                      |            |      |                |   |
| in boxes                                                      | 18         | 0    | 2              | 6 |

ARTICLES FOR THE TEETH AND GUMS.

|                                                                                          |    |      |   |   |
|------------------------------------------------------------------------------------------|----|------|---|---|
| Circassian Opiate, for strengthening and beautifying the Teeth, in pots, per doz.        | 8  | 0    | 1 | 0 |
| Ditto                                                                                    | 12 | 0    | 1 | 6 |
| Ditto                                                                                    | 18 | 0    | 2 | 6 |
| Poudre de China                                                                          | 8  | 0    | 1 | 0 |
| " de Ceylon                                                                              | 12 | 0    | 1 | 6 |
|                                                                                          | 18 | 0    | 2 | 6 |
| Odontine, a very superior article for preserving the Teeth                               | 18 | 0    | 2 | 6 |
| Vegetable Dentifrice Tooth Powder                                                        | 8  | 0    | 1 | 0 |
| Antiscorbutic ditto                                                                      | 10 | 6    | 1 | 6 |
| Prepared Charcoal Tooth Powder,                                                          |    |      |   |   |
| Vine, Rose, Violet, Vegetable,                                                           | 4  | 0    | 0 | 6 |
| and Camphorated Chalk ditto                                                              | 8  | 0    | 1 | 0 |
| Eau Balsamine for whitening the Teeth, strengthening the Gums, and sweetening the Breath | 1  | 4 0  | 3 | 6 |
| Elixir pour l'entretien des dents et des Genuves, half-pint bottles                      | 1  | 16 0 | 3 | 0 |

STATION

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OFFICE, 53, KING WILLIAM STREET,  
LONDON BRIDGE.



# THE TRADE LIST OF BARKER AND CO.'S PERFUMERY.

## ARTICLES FOR THE TEETH AND GUMS *continued.*

|                                                                                                                                                                                                                    | Wholesale. | Retail single |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|
| Barker and Co.'s celebrated Elixir, prepared only by Barker and Co., from the receipt of a celebrated Dentist, and warranted not to possess any of the deleterious or destructive properties of many Tooth Powders | 1 4 0      | 3 6           |
| Pistachio Nut Paste for the Teeth, in pots                                                                                                                                                                         | 1 4 0      | 3 6           |

## ESSENTIAL OILS,

### OF THE FINEST QUALITY.

Equal to samples exhibited by Barker and Co., at the Great Exhibition Building Hyde Park, 1851, Class IV., No. 62, South-west Gallery.

OTTO OF ROSES of unequalled purity, warranted perfectly genuine.

|                    |                                 |             |
|--------------------|---------------------------------|-------------|
| Ditto              | ditto second quality.           |             |
| Rhodium            | Nutmeg                          | Coriander   |
| Bitter Almonds     | Bergamotte                      | Grape       |
| Sandal wood        | Carraway                        | Pine-apple  |
| Cedret             | Peppermint                      | Pimento     |
| Citronella         | Rosemary                        | Dill        |
| Cinnamon           | Verbena                         | Raspberry   |
| Thyme, red & white | Cassia                          | Citron      |
| Orange             | Petit Grain                     | Fennel      |
| Cloves             | Lavender, (English and Foreign) | Calamis     |
| Limette            | Anniseed                        | Ginger      |
| Neroli             | Sweet Briar                     | Lemon Grass |
| Juniper            | Lemon                           |             |
| Sassafras          |                                 |             |

&c., 1, BREAMS BUILDINGS, CHANCERY LANE. 15

The variation in the market renders it impossible to state the price of the Essential Oils, but a List containing the current Prices will be supplied on application, and the Trade may rely on being served with every Article of the best quality at the lowest market Prices.

Olive Oil, Castor Oil, and French Triple Oils of the finest quality.

A Great Assortment of French and other Foreign Perfumery and Fancy Articles.

LONDON

PRINTED BY JOHN KING, 120 FLEET STREET.

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MILLWALL, POPLAR, NEARLY OPPOSITE GREENWICH.

OFFICE, 53, KING WILLIAM STREET,  
LONDON BRIDGE.

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STATION  
FOR HYDRAULIC APPARATUS AND TANKS,  
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1849

BARKER & CO.,

SOLE AGENTS FOR THE SALE OF

LIPSCOMBE'S PATENT FOUNTAIN

PRICE £1 15 6d.

GET OUT TO BILLS AND PARTIES.

SIR WILLIAM BURNETT'S  
PATENT PROCESS,  
FOR THE PRESERVATION OF  
TIMBER, CANVAS, CORDAGE,  
COTTON, WOOLLEN,  
ETC., FROM  
DRY ROT, MILDEW, MOTH, AND DECAY.

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PART I.  
PROSPECTUS, AND TESTIMONIALS AS TO  
**PREPARED CANVAS, WOOLLEN, &c.**

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PART II., *as to* PREPARED CANVAS, CORDAGE, &c., and

PART III., *as to the* PRESERVATION of ANIMAL SUBSTANCES,  
*and the* PURIFICATION of BILGE-WATER, *with Reports on*  
SIR W. BURNETT'S DISINFECTING FLUID,

MAY BE OBTAINED, ON APPLICATION AT THE OFFICE.

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STATION  
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LONDON BRIDGE.



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## PROSPECTUS.

THE following are some of the peculiarities and advantages of Sir William Burnett's Patent process.

### ITS EFFECTS ON WOOD.

It hardens and improves its texture. It enters into permanent chemical combination with the ligneous fibre; and does not come to the surface of the wood by efflorescence, like other crystallisable salts; and no amount of washing or boiling in water will remove the chemical compound so formed.

It preserves wood and other articles from the adherence of animal and vegetable parasites, and also from the attacks of insects.

It completely preserves wood from *wet* and *dry* rot.

It renders the wood perfectly unflammable, when used of a certain requisite strength.

(See Reports, from S. M. Peto, Esq., M.P., R. B. Dockray, Esq., C.E., Professors Graham, Brande, and Cooper, Part I., p p. 5, 14, 15.)

### ITS EFFECTS ON CANVAS, CORDAGE, COTTON, ETC.

The Preparation preserves these articles from mildew and rot. It renders them more pliable; does not in the slightest degree discolour them; and washing or boiling in water will not remove the combination from their fibres.—(See Testimonials, from Professors Brande and Cooper, Part II., p p. 5, 6.)

### ITS EFFECTS ON WOOLLEN.

Woollen prepared by this process will be preserved from mildew and rot: it will not be attacked by moths; and washing or boiling will not remove the combination from it.—(See Testimonials, Part II., from C. Toplis, Esq., p p. 6, 7; and Mr. T. Morton, p. 27.)

### ITS EFFECTS ON ANIMAL MATTER.

It is used for the preservation of anatomical subjects; and green hides are effectually preserved from decomposition, by being subjected to the process.—(See Testimonials, Part III., from W. Bowman, Esq., F.R.S.; Professor Sharpey; W. V. Pettigrew, Esq.; Richard Partridge, Esq.; and James Murray, M.D.)

### ITS EFFECTS ON BILGE-WATER.

It completely neutralizes the offensive effluvium arising from bilge-water on board ships.—(See Testimonials, Part III.)

### ITS EFFECTS ON METALS.

IRON or other metals are not oxidated or dissolved, either when immersed in the Solution, or imbedded in wood prepared in it.—(See Testimonial, Part I., from J. Mitchell, Esq., C.E., p. 12—Part III., W. Bowman, Esq.; and W. V. Pettigrew, Esq.)



The Testimonials in the following pages—the *originals of which may be seen at the Office in King William-street, City*—incontestably prove the great value of Sir William Burnett's process, and its superiority over every other.

The process is comparatively inexpensive, and cannot by possibility endanger health, either in its preparation or in its application. It has been tested for a series of years past, by order of the Lords Commissioners of the Admiralty; it is now in extensive use in Her Majesty's Dockyards, for preserving all kinds of timber for ship-building and other purposes, as well as for the preservation of canvas, and the purification of bilge-water in Her Majesty's ships.

Numerous railway and other public companies, noblemen, private gentlemen, ship-owners, &c. &c. &c., are using the Patent for the like purposes, in all parts of Great Britain and Ireland; many of whom have borne testimony to the efficacy and economy of the process.

### Terms for granting Licences

#### TO USE THE PREPARATION:

For its use for the whole term of the Patent, one payment of *three shillings* per cubic foot, according to the internal area of the Tank desired.

Or a rental of one shilling per cubic foot per annum, agreeably to the aforesaid measurement, for the same term. In either case the Proprietors undertake to supply the material at *one shilling* per pound; one pound being sufficient for ten gallons of water.

Or, if preferred, Licences will be granted for the use of the Patent Preparation, without any payment on the area of the Tank; but, in this case, the material will be *1s. 6d.* per lb.

Payment in all cases being required by anticipation.

### Charges

#### FOR PREPARING MATERIALS AT THE STATION OF THE COMPANY, BY THE HYDRAULIC PROCESS:

|                                                                           |    |    |             |
|---------------------------------------------------------------------------|----|----|-------------|
| For TIMBER, round or square, including Planks, Deals, Hop-                | s. | d. | per Load    |
| poles, Paving-blocks, and Railway-sleepers - - -                          | 12 | 0  | 50 cub. ft. |
| <i>Landing and Loading — per Load.</i>                                    |    |    |             |
| „ Park-palings, Cabinet-work, Wine and other Laths,—<br>as per agreement. |    |    |             |
| „ CANVAS - - - - -                                                        | 3  | 6  | per Bolt.   |
| „ Sails, Tents, Awnings, Rick-cloths, &c. - - -                           | 0  | 3  | per Sq. Yd. |
| „ Corn and other Sacks - - - - -                                          | 0  | 6  | each.       |
| „ White Yarn - - - - -                                                    | 4  | 6  | per cwt.    |
| „ NETS, exceeding 28 lb, not exceeding 56 lb - - -                        | 4  | 0  | each.       |
| „ „ 56 „ „ 84 „ - - -                                                     | 6  | 0  | „           |
| „ „ 84 „ „ 112 „ - - -                                                    | 8  | 0  | „           |
| „ WOOLLENS,—as per agreement.                                             |    |    |             |

Further information may be obtained, Specimens seen, and special Terms entered into, when the quantity of Materials to be Burnettized is large,—on application to Mr. JACKSON, Secretary, at the Office, or at the Station.

May, 1851.

### TESTIMONIAL

*As to the condition of Burnettized Sleepers of Scotch Fir on the Eastern Counties Railway, at the expiration of TEN YEARS.*

*Eastern Counties Railway, Office, Bishopsgate Station,  
London, 14th January, 1851.*

SIR:

Having reference to your letter of the 3rd instant, I beg to acquaint you, for the information of the proprietors of Sir William Burnett's Patent, that the Scotch fir sleepers prepared by that process, and laid down in May, 1841, as certified by Mr. Peto, on this Company's line of railway, between Roydon and Burnt Mill, have just been examined by the Superintendent of works, and he reports that they are in a perfectly sound state.

I am, Sir, your obedient servant,

(Signed) C. P. RONEY,  
Secretary.

To Lieut. Jackson, R.N.,  
Office of Sir William Burnett's Patent,  
53, King William-street, London-bridge.

*Eastern Counties Railway, Office, Bishopsgate Station,  
London, 9th May, 1851.*

SIR:

Referring to your letter to me of the 20th of January last, I am instructed by the Directors to inform you that they have determined to apply Sir William Burnett's process to such sleepers (that are not already creosoted and in store) as may be required for the repairs of the Company's line, now about to be commenced between Stratford and Stortford.

You will please put yourself in communication with Mr. Ashcroft, the Company's superintendent of works, on this subject.

I am, Sir, your obedient servant,

(Signed) C. P. RONEY,  
Secretary.

To Lieut. Jackson, R.N.,  
Office of Sir W. Burnett's Patent,  
53, King William-street, London-bridge.

The strongest test that I have given to the use of the two Preparations is, by steeping in them uprights, 1 inch square, of larch, for training espalir-trees in my garden. They are put from 1 foot to 18 inches into the ground, and I find them as sound at present as when first used, whilst others which were not tanked have rotted after a short time. I have likewise a good report to make of all other purposes for which I have used this Patent, but the espalir stakes come so immediately under my constant notice, that I cannot help particularly mentioning them, as a very strong and trying proof of the efficacy of the Patent.

I have likewise used it for tanking sap oak laths, for roofing farm-houses and buildings with slate, rendering them inside; and at present I have no reason to complain, but as I am not sure whether I am acting fairly towards this Patent in so testing it, I shall feel much obliged to you to give me your opinion on this point. This Patent may preserve, as we find it does, the common ordinary woods from insects and decay, but it may, perhaps, be too much to expect that it will allow us to use woods with sap in them, such as oak sap laths.

I am, Sir, yours faithfully,

(Signed) J. W. LYON WINDER.

To C. Jackson, Esq., Secretary.



| <i>Landing and Loading — per Load.</i> |                                                    |           |                        |
|----------------------------------------|----------------------------------------------------|-----------|------------------------|
| „                                      | Park-palings, Cabinet-work, Wine and other Laths,— |           |                        |
|                                        | as per agreement.                                  |           |                        |
| „                                      | CANVAS                                             | - - - - - | 3 6 <i>per Bolt.</i>   |
| „                                      | Sails, Tents, Awnings, Rick-cloths, &c.            | - - - - - | 0 3 <i>per Sq. Yd.</i> |
| „                                      | Corn and other Sacks                               | - - - - - | 0 6 <i>each.</i>       |
| „                                      | White Yarn                                         | - - - - - | 4 6 <i>per cwt.</i>    |
| „                                      | NETS, exceeding 28 lb, not exceeding 56 lb         | - - - - - | 4 0 <i>each.</i>       |
|                                        | „ 56 „ „ 84 „                                      | - - - - - | 6 0 „                  |
|                                        | „ 84 „ „ 112 „                                     | - - - - - | 8 0 „                  |
| „                                      | WOOLLENS,—as per agreement.                        |           |                        |

Further information may be obtained, Specimens seen, and special Terms entered into, when the quantity of Materials to be Burnettized is large,—on application to Mr. JACKSON, Secretary, at the Office, or at the Station.

## PART I.

### TESTIMONIALS

AS TO

PREPARED TIMBER, HOP-POLES, ETC.;  
THE PROTECTION OF WOOD FROM FIRE;  
ETC. ETC.

From S. M. PETO, Esq., M.P.

SIR : 3, Great George-street, Westminster, 8th January, 1849.

In answer to your inquiry respecting some sleepers which were prepared for me by Sir W. Burnett's process, and which were laid down on one of the lines of railways executed by me in the year 1841, I have to acquaint you they are now in as perfectly sound a state as when they were first laid, whilst those that were put down in juxtaposition with them at the same time, unprepared, are quite decayed.

To Lieut. Jackson,  
Secretary to Burnett's Patent.

I am, Sir, yours obediently,  
(Signed) S. M. PETO.

From R. B. DOCKRAY, Esq., C.E.

London and North Western Railway, Engineer's Office,  
Euston Station, 14th August, 1848.

DEAR SIR :

In reply to your inquiry respecting the state of the sleepers on the Peterboro' Branch Railway, which were prepared under Sir Wm. Burnett's process, I have to inform you that we could only find thirty which we could recognize as having been so prepared; they are all perfectly sound, and have been in the road about six years.

To Mr. Jackson,  
53, King William-street, City.

Yours very truly,  
(Signed) ROBERT B. DOCKRAY.

SIR :

Vaenor park, Welchpool, 12th May, 1849.

In answer to your letter, requesting my opinion of the value of Sir W. Burnett's Patent, which I have used since 1843, I beg to say that I have every reason to be satisfied with it, and that I find it equally efficacious as that of Kyan, which I had previously used—and cheaper.

The strongest test that I have given to the use of the two Preparations is, by steeping in them uprights, 1 inch square, of larch, for training esplanade-trees in my garden. They are put from 1 foot to 18 inches into the ground, and I find them as sound at present as when first used, whilst others which were not tanked have rotted after a short time. I have likewise a good report to make of all other purposes for which I have used this Patent, but the esplanade stakes come so immediately under my constant notice, that I cannot help particularly mentioning them, as a very strong and trying proof of the efficacy of the Patent.

I have likewise used it for tanking sap oak laths, for roofing farm-houses and buildings with slate, rendering them inside; and at present I have no reason to complain, but as I am not sure whether I am acting fairly towards this Patent in so testing it, I shall feel much obliged to you to give me your opinion on this point. This Patent may preserve, as we find it does, the common ordinary woods from insects and decay, but it may, perhaps, be too much to expect that it will allow us to use woods with sap in them, such as oak sap laths.

I am, Sir, yours faithfully,

To C. Jackson, Esq., Secretary.

(Signed) J. W. LYON WINDER.

B



## FURTHER TESTIMONIAL.

SIR:

*Vaenor-park, Berriew (Welchpool),  
12th January, 1850.*

In answer to your letter, requesting me to give you the result of my further experience of the value of your Preparation, I beg to say that I have only to confirm what I have already communicated to you—namely, the great benefit to be derived by its proper application.

I continue to use it by immersing *sap laths*, of a proper strength for roofing, and neither I nor my agent have ever heard that they have not proved as good and as lasting of heart of oak laths.

You are perfectly welcome to make any use you please of the result of my experience of the use of your Preparation.

I am, Sir, your faithful servant,  
(Signed) J. W. LYON WINDER.

To Sir W. Burnett, &c. &c. &c.

SIR:

*Gosport, 30th January, 1850.*

With respect to my experience as to the effect of Burnett's Patent Solution, I beg to acquaint you that in the erection, in this neighbourhood, of two churches and two school-houses, built respectively eight, seven, six, and five years since, I caused the boards of the ground flooring to be saturated with the protective fluid alluded to, and that it has proved perfectly successful.

In one of the instances, indeed, the ground, from its moist nature, was of a description to hasten more than usually the decay of flooring laid next above it; yet the boards of this, as well as the other three buildings, continue in a sound and perfect state.

I am, Sir, your obedient servant,  
(Signed) JAS. ADAMS,  
*Architect.*

To the Secretary, Burnett's Patent Office.

*From Earl Minto's Steward, dated Minto by Hawick, 13th February, 1841.*

I beg to acquaint you that we applied Sir William Burnett's Patent to oak, elm, ash, larch, white spruce, and Scotch firs. The oak, elm, ash, and larch, being naturally hard, we could not observe so very decidedly the effects of the Process upon them, except that any part of them which was *white wood*, was rendered equally hard as the red parts.

The white spruce and Scotch firs, which are very soft, were rendered as hard as the larch wood.

To the Secretary, Burnett's Patent Office.

E. SELBY.

## FURTHER TESTIMONIAL.

MY DEAR SIR:

*Minto, 11th January, 1850.*

In reference to my experience of Burnettized wood, I beg to say that, about six years ago, I had a water-wheel made of Burnettized larch and spruce, and a part of it of the best Baltic fir, un-Burnettized. This wheel is in a pit where timber very soon rots. I have been down and examined the woods minutely, and I can vouch for the larch and spruce being now quite sound, and the Baltic fir (which showed symptoms of decay about two years ago) being now quite rotten. The spruce has all the appearance of lasting as long as the larch.

I had also Burnettized larch paling (all young wood) put up eight years ago, which continues free from decay; and a fence of the same kind of wood, un-Burnettized, erected the same season, has required to be nearly all renewed. Indeed, I have used Burnettized wood since 1840, with great advantage, for all sorts of building purposes.

My brother-in-law, Commander Rutherford, R.N., has often told me of the great saving the Patent must be to the Navy, on sails, which, when laid by damp, were all mildewed in twenty-four hours, but, when Burnettized, there is no reason to fear mildew: he is from home, otherwise he might have given me a more valuable letter upon the subject.

As to the deodorizing properties of the patent preparation, he speaks most highly of the benefit derived from its use on the coast of Africa, from which station Commander Rutherford returned about a year ago.

I am, my dear Sir, yours most truly,  
To Charles Jackson, Esq., Secretary. (Signed) EPHRAIM SELBY.

SIR: Office of Works, Woburn Park, 17th Sept., 1844.

His Grace the DUKE of BEDFORD wishes a few specimens of English woods prepared, in order that he may give Sir W. Burnett's patent a fair trial, the **principal object being, in case it answers, to use Scotch fir for enclosing posts, and beech for gate-posts.**

When they are sufficiently tanked, I will trouble you to direct them to me, per Atterbury's waggon, from the Windmill Inn, St. John-street.

They were packed in a box, and sent, per Atterbury, carriage paid, to you this morning.

I remain, sir, your obedient servant,

(Signed)

C. HACKER,

Superintendent of Works.

C. Jackson, Esq.,

Secretary to Sir W. Burnett's Patent,

53, King William-street, London.

#### REPORT ON THE ABOVE IN 1850.

Woburn Park, Office of Works, 22nd February, 1850.

I hereby certify that I have examined the "Burnettized" and unprepared counterparts of beech, Scotch fir, larch, and elm, which I had placed in the earth, against a wall, in the autumn of 1844, and

That I found all the "**Burnettized**" pieces **perfectly sound.**

The *unprepared* elm was so **completely rotten** that it broke, although great care was taken to remove it, after clearing away the soil. The stump was soft and spongy, and might almost be taken for a lump of mould.

The *unprepared* larch was not nearly in so bad a state; in fact, it would stand the test some time longer.

The *unprepared* specimen of beech was also **thoroughly rotten**; it broke in the ground, although the earth had been carefully removed for the purpose of taking it out entire; and the stump was so decomposed and mixed with the soil, that it could not be collected.

The *unprepared* Scotch fir was in a similarly **rotten state**, although, by great care, it was not broken in being removed from the soil.

(Signed)

C. HACKER,

Superintendent of Works.

From Lord Palmerston's Agent.

SIR: Broadlands Farm, 29th April, 1850.

I beg to acknowledge the receipt of the pamphlets, for which I am obliged.

With respect to the Burnettized wood, I can only inform you in a general way of its perfect success.

I was not at Broadlands at the time it was used, but it seems that larch posts for railing were prepared in your solution, and that whereas others unprepared have been removed perfectly rotten, these remain quite sound.

I am, sir, your obedient servant,

C. Jackson, Esq.

(Signed)

WM. KENDLE.

SIR: Ince Blundell Hall, March 20th, 1850.

In answer to your inquiry to my opinion as to the effect of Sir W. Burnett's patent process, I beg to inform you that, after about seven years' experience, I am fully satisfied of its great efficacy in preventing decay, particularly as regards its application to soft woods.

When I first made use of it, I made an experiment by burying, in a wet and dry ditch, some pieces of English fir—some steeped in the patent mixture, and some not; after the lapse of about three years, I took up the pieces in question, and found that, while the unprepared pieces were covered with fungi (of several sorts) and quite soft, and clearly in the course of rapid decomposition, the prepared timber was thoroughly hard, sound, and perfectly free from the adhesion of any vegetable matter.

Believe me, yours, &c., &c.,

(Signed)

THOS. WELD BLUNDELL.

Charles Jackson, Esq.



*Testimonials as to*

DEAR SIR WILLIAM: *Wilton-place, 22nd January, 1850.*

I send you a specimen of railing of **young wych elm**, which was cut down **in the summer**—sawn up, prepared with your solution, and put down immediately.

The railing has been standing seven years and six months, and the whole is as sound as this specimen, and has never required any repair.

I am, dear Sir William, very truly yours,

(Signed) RICHARD T. CLARK.

To Sir William Burnett, K.C.H., &c. &c. &c.

SIR: *Cromer, 28th January, 1850.*

It is nearly eight years since I used Sir Wm. Burnett's Patent Chloride, in preparing beech timber for the erection of a groin or breakwater, for the late Sir Powell Buxton, Bart., at Trimingham, in Norfolk, and am happy to say it still stands untouched by worms, and by removing a very slight shaving from the surface of the piles, the wood appears quite fresh and free from decay, to which beech is liable.

In quickly seasoning **green timber**, it appears invaluable; the beech timber above alluded to was cut down, not only green, but in **full leaf**, and used immediately.

I am, Sir, yours obediently,

(Signed) HENRY SANDFORD.

To Chas. Jackson, Esq., Secretary,  
Sir W. Burnett's Patent.

SIR: *Petworth Park, 28th November, 1845.*

In answer to your inquiry as to my opinion of Sir William Burnett's process, I beg to inform you that, after two years' experience, I think so favourably of it, I propose using it on Colonel Wyndham's estate at Petworth more extensively than has been done hitherto.

I find it very useful for preparing oak sap-rails, English fir, beech, and all timbers that are at all liable to be attacked by the worm.

As the time required for simple immersion in the Patent liquid could not generally be spared, Colonel Wyndham has had a hydraulic apparatus fixed at Petworth, which will enable much larger quantities of timber being prepared; to which he now proposes to add a small steam-engine.

I am, Sir, your humble servant,

To C. JACKSON, Esq.,  
Secretary of Sir William Burnett's Patent. HENRY UPTON.

## FURTHER TESTIMONIAL.

SIR: *Petworth-park, Sussex, 10th May, 1849.*

I have used Sir W. Burnett's Preparation for the preservation of timber, on Colonel Wyndham's Estate, from September 1843. The wood is placed in an iron cylinder; the air is extracted by one pump, and the liquid afterwards forced into the pores of the timber by another pump.

I have found it useful in preserving young oak, fir, and beech timbers, which otherwise soon decay; I had previously used Kyan's preparation of corrosive sublimate of Mercury, but prefer the Chloride of Zinc, as being less expensive and not injurious to ironwork.

To Charles Jackson, Esq.,  
53, King William-street, City, London. I am, Sir, your humble servant,  
(Signed) HENRY UPTON.

## FURTHER TESTIMONIAL

AS TO THE DURABILITY OF BURNETTIZED OAK SAP-LATHS.

SIR: *Petworth-park, 21st January, 1850.*

The following is a correct account of the laths which I have sent to you. They are all from young **oak sap-wood** (outside stuff next to the bark), and taken about the same time from the stack in the yard; they were nailed up together indiscriminately (prepared and unprepared), in an unfinished room on the bed-room floor at the south end of Petworth House, in January 1847. Those which were Burnettized are all hard and sound, and those which you will see are nearly reduced to powder and eaten by the worm, are those which were not prepared.

The room is dry, with good light and air, and no plaster has yet been put on the

laths. I shall be happy to show the room to any person, who may wish to satisfy himself on the efficacy of Sir Wm. Burnett's process in preserving the **sap of oak**.

I am, Sir, your obedient servant,

To C. Jackson, Esq., Secretary.

(Signed) HENRY UPTON.

SIR :

Rise, Hull, October 3rd, 1845.

In reply to your communication, I beg to state, that I have found the result of Sir William Burnett's preparation quite satisfactory.

I tanked some *oak saplings* for a fence, which have been down three years without any signs of decay; and I also tanked some Scotch fir planks for boarding a school-room: the result has been, that in three years they have not shrunk as deals usually do. I have likewise had some prepared Scotch fir and elm in use as palings two years, now perfectly sound.

(Signed)

W. BETHELL.

MY DEAR SIR WILLIAM :

Pitfour, Mintlaw, N. B., October 18th, 1845.

Since 1842, your composition for the preservation of timber has been in constant use.

The benefits and advantages derived from it far exceed our expectations.

The great proportion of timber grown here is of the fir tribe. The quality generally soft and spongy.

The composition has given it hardness, durability, and *real value*; and I may mention that, after a trial of nearly three years, palings erected, in many cases on marshy ground, are sound and free from decay.

Palings, so erected, and unprepared, would not have endured many months.

My dear Sir William, your faithful servant,

To Sir Wm. Burnett, K.C.H., &c. &c. &c.

GEO. FERGUSON.

#### FURTHER TESTIMONIAL.

SIR:

Charles-street, 9th May, 1849.

Five years added to previous experience confirm the opinion formerly given of the inestimable properties of Sir William Burnett's composition.

Timber of every variety is prepared in the Solution, the effect of which is to give hardness, endurance, and value, beyond my most sanguine expectations.

It has likewise been extensively used in cottages and other buildings, to disinfect and to purify.

The good effects produced thereby have proved a blessing to many of the poorer and labouring classes.

I have the honour to be, obediently your servant,

(Signed) GEORGE FERGUSON,

Charles Jackson, Esq., Secretary, &c. &c.

Rear-Admiral.

DDAR SIR :

Warmwell House, near Dorchester, 11th November, 1848.

I am happy to tell you that the timber (Scotch fir cut out of my own plantation, which I had soaked five years since and placed in a very trying situation, does not shew the slightest symptom of decay, while some of the same timber, not soaked, used in a comparatively dry place, is evidently decaying fast. I am so satisfied with what I have seen of its property in preserving timber, that I have used nothing else but my own fir in some farm and other buildings which I have been lately erecting, as I am certain it will be quite as durable as the best foreign timber.

I am, Sir,

— Jackson, Esq.

Yours very truly,

Sir W. Burnett's Office for Solution  
for Timber, King William-street, City, London.

Signed AUGUSTUS FOSTER.

In the month of June 1846, I laid down on the roofing of my house in Dublin, about 80 feet superficial of boards, one inch and a half in thickness, of elm, which had been previously well steeped in the Patent Solution.

These boards were raised a few inches over, and supported on the leaden gutters in order to protect the lead from injury, and also from the influence of great heat in



summer and frost in winter. I have from time to time examined these boards, and I find that they remain perfectly sound and clean.

I should think they have been subjected to a severe trial under such exposure to the weather, and which they could not in an unprepared state have endured.

4, Hume-street, Dublin, 23rd March, 1849. (Signed) THOMAS BERRY.

## FURTHER TESTIMONIAL

IN REFERENCE TO THE ABOVE.

MY DEAR SIR: 4, Hume-street, Dublin, 28th May, 1850.

Please to forward to me as before four seven-gallon jars of the patent solution.

I lately tried the edges of the elm planks (referred to in my testimonial) with a plane: they are as hard and as sound as on the day they were first cut. Now, I have seen decay set in more rapidly and extensively in elm than in almost any other timber, when exposed to the weather; and I am certain these planks could not have lasted in an unprepared state.

I am, my dear Sir, faithfully yours,

(Signed) THOS. BERRY.

Charles Jackson, Esq., Secretary.

Royal Hospital, Haslar, 25th February, 1839.

Having had occasion, two years and a half since, to repair the water-closet in the 76th, and some wood-work in the 40th ward of the Royal Naval Hospital at this place, I found, in so doing, that the timber was in such a complete state of dry rot, with immense fungi attached, as in many parts to leave the bare paint alone on the face of the wood; which wood had been put up new about five years before. This was replaced by Sir William Burnett's prepared timber, which, on inspection, is now found to be as perfectly sound as it was the day when first fixed, that being, as above stated, two years and a half since.

I discovered, eighteen months ago, many other parts of the building also in a very defective state, and having replaced these defects with wood saturated with Sir William Burnett's preparation, I now find the wood in question to be as sound and perfectly free from dry rot, as when first used.

I am, therefore, of opinion, that timber prepared with Sir William Burnett's solution, will be productive of a very great saving to the Public.

THOMAS BAKER.

Inspector of Works.

## FURTHER TESTIMONIAL,

after nearly fourteen years.

Haslar Hospital, May 29th, 1848.

I beg to certify that I have seen the wood referred to by Mr. Baker in the annexed communication, and it is in a remarkably clean, sound, and perfect state of preservation.

(Signed)

W. E. PARRY,  
Capt. Superintendent,  
Haslar Hospital.

29th May, 1848.

SIR:

In answer to your directions of this morning, I respectfully beg to inform you that I have examined the wood referred to, which was saturated in Sir Wm. Burnett's Solution in the year 1836, and I find it in a perfect, clean, and sound state, there being no particle of fungus to be seen; and I beg further to state, that I am still of the same opinion, as to its efficiency, as when I last sent my report.

I am, Sir,

Your most obedient humble servant,  
(Signed) THOS. BAKER.

To Capt. Sir W. E. Parry, R.N., F.R.S.,  
Superintendent, &c. &c. &c.

Copy of a Letter from Captain T. E. Rogers, Superintendent of the Hon. East India Company's Marine, at Calcutta, dated 12th August, 1850.

SIR:

I have made inquiries about the specimens of wood you sent me in 1846: some of them, I am sorry to say, have been lost, but there are two pieces of fir and two pieces of peon, that have been lying in a damp corner of one of the storekeeper's godowns. Their present state is as follows:—

In the case of the pieces impregnated with the solution, neither the white ants nor decay have made the least impression: in the others, although the white ants only peeled off some of the outside, they were considerably decayed, apparently from the moisture which surrounded all the specimens. I should tell you that the trial-pieces have been for the last three years in a place where no fire can be kept for any time without the white ants devouring it: a door not far off has been riddled by them.

I have directed the specimens to be kept in their present place, and you can have a further report at some future time.

(Signed) T. E. ROGERS.

To Messrs. Gunter, Greenaway and Co., Calcutta.

*Extract of a Letter from Abercromby Dick, Esq., B.C.S., one of the Judges of the Sudder Dewanny Adawlut (Supreme Native Court), Calcutta, to David Ogilvy, Esq.*

April 7th, 1848.

I must now tell you, the specimens of wood, steeped in Burnett's mixture, went yesterday in the 'Labuan,' packed in a box. Captain Alston took charge of them, and will deliver them to my brother William, to whom you had better write about them. They are four pieces, teak, saul, toon and deal, steeped and marked with a B, to denote they have been Burnettized, and four similar pieces marked N, or not Burnettized. They were all placed close to each other, where white ants and damp abounded. Those steeped are all untouched, though the ants have left marks of attempts. Of the others, the two hard woods, teak and saul, are a little touched, the toon much more, the deal eaten through and through. In the box are also specimens of country paper, some steeped, some not, and you will readily perceive how good a preservative your Burnett's Patent is. I have washed all my books with it, using a painter's brush, and used it in paste for binding books. To the natives, for records, and to the government, it will be invaluable. I shall make some more experiments on paper, and, when ready with proof, shall propose its use to the government and to the natives.

*Important Official Documents respecting the condition of some prepared and unprepared TIMBER, WHICH HAD BEEN IN THE FUNGUS PIT NEARLY FIVE YEARS.*

SIR:

Admiralty, 26th July, 1841.

I am commanded by my Lords Commissioners of the Admiralty to send herewith for your information a copy of a Report received from the Officers of the Woolwich Yard, on the state of the timber prepared under your Patent, which had been deposited in the fungus pit.

I am, Sir, your most humble servant,

To SIR WM. BURNETT, K.C.H., F.R.S., &c. (Signed) J. PARKER.

SIR:

Woolwich Yard, 15th July, 1841.

Agreeably to your memo. of this day's date, we have to acquaint you, that we have examined the several specimens of timber which have been prepared by Sir William Burnett, and deposited in the fungus pit at this Yard, and find their state to be as follows, viz.:

PREPARED.

ENGLISH OAK.—Perfectly sound.

ENGLISH ELM.—Perfectly sound.

DANTZIC FIR.—Perfectly sound.

UNPREPARED.

ENGLISH OAK.—Has a small spot of fungus on the end.

ENGLISH ELM.—Doaty.

DANTZIC FIR.—Has fungus on the outside, and is decayed in the heart.

We are, Sir, your most obedient servants,

O. LANG.

R. ABETHELL.

Master Shipwright.

Assistant to the Master Shipwright.

P.S.—The prepared and unprepared deposited in the pit the 25th August, 1836.

To Capt. SUPERINTENDENT HORNBY, R.N., C.B.

N.B.—Some pieces of prepared and unprepared canvas and calico were also placed in the fungus pit at the same time, and on its being opened in May, 1838, for the inspection of its contents, the Official Report stated that, as regarded the canvas and calico, the experiment was decisive and conclusive, the prepared being but slightly injured, and in some cases not at all, whilst the unprepared was entirely destroyed.



The following refers to a quantity of 'Burnettized' deals put down at the same time with other pieces of the same wood unprepared, in a cellar of a house in Chatham Dockyard (where the flooring had been repeatedly destroyed by dry rot, and where large fungi were then growing), in the latter part of the year 1838; the prepared and unprepared planks being placed side by side, alternately. When examined, in the spring of 1842, all the unprepared wood had become completely rotten, and was taken up and replaced by other wood; whilst that which was 'Burnettized' was perfectly sound and clean, and was *re-laid* with new unprepared wood for further wear.

N.B.—Specimens of the prepared and unprepared wood, alluded to above, may be seen at the Office, 53, King William-street.

SIR :

Admiralty, 22nd July, 1842.

I have laid before my Lords Commissioners of the Admiralty, your letter of the 21st instant, and am commanded by their Lordships to acquaint you in reply, that the report of the inspection made at Chatham by Messrs. Fincham and Edye, on some wood prepared according to your Patent, in contrast with unprepared wood placed in the same situation, is FAVOURABLE to the preparation invented by you.

I am, Sir, your most humble servant,

(Signed) SIDNEY HERBERT.

SIR WILLIAM BURNETT, K.C.H., &c. &c.

SIR :

Peckham, Surrey, 28th July, 1842.

I have examined several specimens of timber, canvas, and other materials, which, having been prepared by Sir W. Burnett's process, and, together with other specimens of similar materials not so prepared, had been placed in situations which subjected them to the strongest and fairest comparative test; and I hereby certify that the prepared specimens were in a good state of preservation, and that most of the unprepared specimens were more or less in a state of decay.

(Signed) J. NOLLOTH.

Late Master Shipwright of H. M. Dockyard at Portsmouth.

To the Secretary, Burnett's Patent.

See Official Report from the Officers of H. M. Dockyard, Portsmouth, p. 23, part II., dated 24th, September, 1847.

As to the preservation of a piece of unprepared wood, upon which prepared canvas had been rolled, after remaining eight years and five months in a damp situation.

The canvas and wood were both sound.

But the unprepared canvas and the wood upon which it was rolled were completely rotten.

The Report says,—

"And the sound state of the roller upon which the prepared canvas was rolled, as compared with the other, is very remarkable, it having been cut from the same spar."

SIR :

Dockyard, Woolwich, 28th December, 1841.

I have sent, by the Admiralty Boat, a small case containing the piece of board which has been on the bottom of the Riggers' Launch since March, 1837. It has been (with very short intervals) in the water ever since that time. It has never been scraped or cleaned; not any vegetable or other substance appears to have adhered to it. I should consider this very satisfactory as to your preparation, tending to keep boats' or vessels' bottoms clean, without paying, in river water. Should you desire this testimony in any other form, I shall be most happy to give it.

I have the honour to be, Sir, your obedient servant,

JOHN COW.

SIR WILLIAM BURNETT, K.C.H., &c. &c. &c.

Foreman of the Yard.

N.B.—This plank may now be seen at the Office, 53, King William-street.

Portsmouth, 8th January, 1839.

In May 1838, I placed in a cellar (where the dry rot has nearly destroyed the floor) a piece of memel fir, prepared with Sir William Burnett's Solution; also a piece of memel fir without being so prepared, closed the door, and did not open it again until the latter end of December in the same year. It should here be noticed, that the floor of the cellar is constantly under water. The pieces of timber were placed on a stone

shelf about 4 feet above the water. On examining the timber, the piece not prepared was warped, and its surface covered with blue spots, strongly resembling the appearance of decay on boarded linings against damp walls. The piece prepared with Sir William Burnett's Solution, *did not* exhibit a similar appearance, but appeared to have resisted the moisture, *which ran off the surface on being removed.*

Signed WILLIAM BURGESS,  
Clerk of Works, Royal Engineer Department.

SIR:

Royal Dockyard, Sheerness, 29th April, 1839.

In reply to Sir William Burnett's inquiry relating to some pieces of wood prepared by him, and sent to this Yard to ascertain the effects produced on them when subject for a given period to a sub-marine immersion; and whether during that immersion any effect was produced by the preparation on the iron nails with which they were necessarily secured to the piles under water; I beg to state that it is my decided opinion the preparation on prepared pieces of wood has had no injurious effect on the iron nails by which they were fastened, nor does the preparation appear in any way to hasten the oxydation of the metal. I subjected two pieces of wood at the same time (and of the same kind), one prepared, the other not, and from a careful examination afterwards, I AM DECIDEDLY OF OPINION, THAT THE PREPARATION DOES NOT HASTEN THE OXYDATION OF METAL, AND ON COMPARISON WITH THE UNPREPARED PORTION, APPEARS TO RETARD IT.

THE WOOD WAS TWO YEARS SUBJECTED TO THIS EXPERIMENT.

TO DR. WARDEN.

I am, Sir, your most obedient servant,  
J. MITCHELL.  
Civil Engineer.

SIR:

August 9th, 1838.

You requested me to put certain specimens of wood in a place I considered most likely to decay them in the shortest period possible. I received six pieces from you, and put them in a close damp place, on the 6th of July, 1836. The prepared pieces were marked with 'W.B.' twice; the unprepared pieces with the same letters, once. In the place where I put them, I had witnessed the fatal effects of the dry rot on some wood I had deposited there in store.

I examined them on the 13th July, 1837, and found all the prepared pieces perfectly sound. The unprepared pieces, with the exception of a piece of fir, showed decided signs of decay by the dry rot.

I replaced them again, to give them a longer trial, and again examined them on the 20th May, 1838, when I found all the prepared pieces perfectly sound.

I also found a piece of fir, unprepared, sound; the other unprepared were oak and elm, which I found thoroughly diseased and rotten on the surface.

It is necessary for me to remark, that the piece of unprepared fir that remained sound, was of that mixed nature with turpentine, that it must take a considerable period to decay it, in the most trying situation.

I beg further to remark, that the piece of prepared oak had a quantity of sap in it, and which I found as sound as when first placed for trial. This I consider most important, as the sap of oak has no durability or strength.

On the 29th December, 1836, I received from you two pieces of canvas, and two pieces of calico and cotton. One of each was prepared, and the other not. I put them in the same place with the wood, for trial. On examining them, I found the prepared canvas perfectly sound, and the unprepared very rotten. The prepared calico had a slight mark of decay on it; the unprepared calico was thoroughly rotten, and falling to pieces.

The statements I have made are the mere facts which I witnessed on the trial of the before-stated materials.

Being, sir, rather sceptical in the belief of any certain remedy being found for the prevention of dry rot, I must declare, the trial I have witnessed of the effect of your preparation is such as to leave not the shadow of a doubt but it will have the good effect desired.

I am, Sir, your most obedient and humble servant,  
Sir William Burnett, K.C.H., &c. &c. (Signed) JOHN INGRAM.

Portsmouth, 27th January, 1842.

Lieutenant-Colonel Piper, R.E., in reply to Sir W. Burnett's note of the 24th instant, on the subject of four pieces of plank, which in February 1839 were deposited beneath the floor of one of the shifting-houses at Marchwood; the one of two pieces



being of oak, and the other of fir, which had undergone the process of the patent for the prevention of dry rot and mildew; as also two other pieces of plank, the one of oak and the second of fir, all of the same dimensions, which had undergone no process at all; has the pleasure to mention, that in conjunction with Mr. Burgess, the clerk of works, he minutely examined the planks in question when last there, and that they found the two which had received the benefit of the process perfectly sound, but those which had not been subjected to it, in a state fast approaching to dry rot, and smelling offensively, being covered with a yellow powder, and a greasy-mattered paler substance; and they therefore concluded that, in a very short time, the one set of planks would become *useless*; whereas, the other would continue *sound*. And should this description be of any service to Sir W. Burnett's views, Lieutenant-Colonel Piper can only feel pleasure in having afforded it.

The planks were then replaced in their previous place of sepulture for further trial.

DEAR SIR: *Botley, near Southampton, 23rd March, 1842.*

The two small frames, with the doors made of Scotch fir of the growth of this neighbourhood, which were saturated with Sir Wm. Burnett's patent preparation, although they have been in a very damp cellar nearly two years, there is not the least appearance of mildew, but are as sound in every respect as when first placed there. The beech plank, saturated soon afterwards, although exposed out of doors, has no appearance of decay.

F. W. JERNINGHAM, Esq.

I am, dear Sir, yours truly,  
Signed W. E. GUILLAUME.

*Extract of a Letter from The Earl of Charleville to Sir W. Burnett.*

I have been using your Patent Solution extensively, with much satisfaction, and have desired the Clerk of the Works to send your Secretary an account of it.

SIR: *Copy of Report, dated Charleville Forest, Ireland, 12th January, 1843.*

I have been using extensively on the Earl of Charleville's Estate, Sir William Burnett's Patent Solution for the prevention of dry rot &c., in timber, since June, 1840. All the timber so prepared has a very satisfactory appearance; I consider it quite as good for *seasoning* timber, and *preferable to the solution of corrosive sublimate for timber that is to be worked on the bench*;—it does not leave that gritty substance on the surface that is left from corrosive sublimate, which is so injurious to the plane-irons. I have also had a large quantity of small poles, or tops, prepared principally of Scotch fir, from one and a half to three inches in diameter, consequently they are nearly all sap. They have been in use about two years in what is commonly called American paling. I find, on examining them, that they are as sound between wind and water, as when put into the ground.

To the Secretary, Burnett's Patent.

(Signed) R. TONG.  
*Foreman to The Earl of Charleville.*

*Tullamore, King's County, Ireland, 10th July, 1843.*

I certify that I have made use of a large quantity of *domestic timber* (beech, elm, and Scotch fir) in the repairs of my boats, which was prepared in Sir William Burnett's process three years since; most of it I find to be perfectly sound, which would not have been the case had it not been so prepared, as I have had, repeatedly, *Memel timber* decayed in less time, in the same situation.

To the Secretary, Burnett's Patent.

(Signed) THOS. BERRY.

SIR: *Tullamore, King's County, Ireland, 17th January, 1842.*

In reply to your note, I beg to say that from my experience of Sir William Burnett's process of preparing timber, it has succeeded perfectly; and has enabled me to effect a very considerable saving in my establishment, by substituting domestic timber where, heretofore, I used the best foreign.

To the Secretary of Burnett's Patent.

I am, Sir, yours faithfully,  
THOMAS BERRY.

*Extract from the "Builder" of the 2nd May, 1846.*

The preservation of Timber from premature decay is a subject which affects so large a number of our readers, that we are bound to give the widest publicity to every inven-

tion that appears likely to effect that object. The various testimonials we have received in favour of Sir W. Burnett's process, and the time that has elapsed since the experiments were first made, lead us to entertain a very favourable opinion as to its efficacy, at all events for a long period of time. The effects ascribed to it are, that it hardens and improves its texture. It enters into permanent chemical combination with the ligneous fibre; and does not come to the surface of the wood by efflorescence, like other crystallizable salts; and no amount of washing or boiling in water will remove the chemical compound so formed. It preserves wood and other articles from the adherence of animal and vegetable parasites, and also from the attacks of insects; and from *wet* and *dry* rot. Further, it renders wood unflammable, when used of a certain strength.

The basis of Sir W. Burnett's process is chloride of zinc, or, as it is more commonly called, muriate of zinc, which seems to have a peculiar affinity to woody fibre, entering into intimate union with its component particles, and forming as it were a new mineralized substance. There is a chemical combination of the metallic base, not merely a mechanical alteration of the position of matter which might be again disunited. There is no decomposition produced, but the fibre of the wood appears to be permanently pervaded by the zinc, and the atoms of which they are formed enter into a new and fixed arrangement.

From Professors BRANDE and COOPER.

SIR:

London, 14th October, 1844.

On examining the specimens of WOOD and canvas which we prepared according to your specification about six months since, and which have remained in damp cellars during the whole of that period, and on comparing them with other specimens which were parts of the same wood and canvas, and which had been similarly exposed without having undergone any previous preparation, we found the specimens of wood not to have suffered any material change,\* but as respects the CANVAS, that which had not been submitted to your process was entirely covered with fungous vegetation, while that which had been prepared by immersion in dilute solution of chloride of zinc, in the manner you direct, was not in the slightest degree so affected.

(Signed.)

WM. THOS. BRANDE,

To Sir W. Burnett, K.C.H.

JOHN THOS. COOPER.

#### FURTHER TESTIMONIALS.

SIR:

London, 4th November, 1845.

We have this day again examined the specimens of canvas and WOOD prepared according to the specification of your patent, and which, in the month of April, 1844, we placed in a damp cellar, where they have remained up to this date.

We are now enabled satisfactorily to corroborate the favourable opinion expressed in our former report. The canvas remains amply protected from all fungous vegetation and rottenness, while a corresponding sample of the same piece, which had not been prepared by immersion in the solution, is entirely decayed, being mouldy, rotten, black, and in places resembles tinder.

We have also lately compared the strength of a fibre of a piece of canvas which we prepared according to your specification, in October, 1844, with that of the fibre of the same canvas, unprepared, and find that it has in that respect sustained no injury. We are therefore of opinion that your process will not, after any lapse of time, tend to deteriorate the strength of the fibres of the substances in question.

In regard to the several samples of different species of WOOD above adverted to, each of which was cut into two, one half being imbued according to the directions of your specification with the dilute solution of chloride of zinc, while the other half was left in its original condition, we have also to make a favourable report, and to repeat our opinion of the efficacy of your process as a preventive of dry rot, and similar sources of decay; the unprepared specimens are manifesting symptoms of decay and mildew, while those which have been protected by your preparation are clean and sound.

(Signed)

WILLIAM THOMAS BRANDE,

JOHN THOMAS COOPER.

To Sir William Burnett, K.C.H., M.D., F.R.S., &c. &c.

\* The period of *six months* being too short for the unprepared wood to become affected.



GENTLEMEN:

London, 30th July, 1846.

In reference to our former statements respecting the efficacy of Sir William Burnett's Patent process for the preservation of TIMBER, Cordage, Sailcloth, and other materials from decay, we beg to repeat that all our subsequent experience has amply justified those statements. We are of opinion that the process, so far from being in any way deteriorating or destructive, is a preservative of vegetable and animal fibre. The specimens of WOOD and of Canvas which we formerly asserted to have resisted the influence of a damp cellar, in which unprepared portions of the same Wood and of the same Canvas became mouldy and rotten, still remain in a sound and protected condition; and as respects the influence of the preservative process upon Canvas laid up in store, we feel entirely justified in concluding from the results of our several experiments, that under such circumstances the protected article will always maintain its superiority in resisting decay, and that it will not itself sustain any injury under influences which would mildew, and impair the quality, strength, and texture of unprepared Canvas.

We are, Gentlemen, your faithful servants,

(Signed) WM. THOS. BRANDE,  
JOHN THOS. COOPER.

To the Proprietors of Sir W. Burnett's Patent.

From WILLIAM RAE, Esq., M.D., Deputy Medical Inspector of Hospitals.

Melville Hospital, Chatham,  
30th October, 1848.

MY DEAR SIR:

Herewith I send you five specimens of wood, two prepared with the Chloride of Zinc, and three unprepared; all of which have been in my cellar, exposed to destructive dry rot, for nearly four years. The two first, you will observe, are of pine, and remain as firm and sound as when placed in the cellar; one of the three last is of pine, and the other two of common fir, all of them being more or less rotten, friable and decayed.

I have been induced to forward these specimens, as forming a strong and convincing proof of the Antiseptic qualities of the Chloride of Zinc, and, in conclusion, may remark that, while fungus grew like wool from the one or unprepared set, it never touched the other.

I remain, my dear Sir,

Your very obedient servant,

To Sir W. Burnett, K.C.H., &c., &c., &c. (Signed) WILLIAM RAE.

## ELECTRIC TELEGRAPH POLES.

A

I hereby certify that I accompanied Mr. Jackson, the Secretary to the Proprietors of Sir William Burnett's Patent, from the Bishopstoke Station of the South Western Railway, this 23rd day of February, 1849, and that I removed the earth with a pickaxe and shovel from around every one of the electric telegraph poles, for a distance of at least four miles and a half from the Bishopstoke Station, towards Winchester; and that I found every "Burnettized" pole as sharp at the corners and as sound as when they were first laid—now, to the best of my recollection, upwards of four years since. These poles are four inches by five above the ground, and, perhaps, six by seven in it. The mile-posts, which are of larger dimensions, and have been in the ground (unprepared) about nine years, are rotten completely through.

(Signed) his  
WM. CANDY.  
mark.

N.B.—See Supplementary Report, B.

Witness JNO. S. LOUTH.

The above Certificate was read over in my presence to William Candy, who states to me that it is the truth.

I have known Wm. Candy for nine years; he is a very trustworthy and experienced railway ganger.

(Signed) JNO. S. LOUTH,

23rd February, 1849. Superintendent of the Bishopstoke Station,  
London and South Western Railway.

## B

*London and South Western Railway,  
Bishopstoke Station, 28th February, 1849.*

When opening the ground to telegraph-posts for Mr. Jackson, I noticed two telegraph-posts near the Bishopstoke Station, which had been up about one year, and unprepared, in a soft state, and not so hard as those prepared with Sir W. Burnett's Patent, although the latter have been in the ground four years.

his  
(Signed) WM. ✕ CANDY.  
mark.

The above was read over to Wm. Candy, who assures me that it is the truth.

N.B.—This is a Supplement to Report A. (Signed) J. S. LOUTH.

## C

We hereby certify that we accompanied Mr. Jackson this morning from Winchester, and that we removed the earth from every one of the "Burnettized" electric telegraph-poles, and ascertained that they were all as sound and hard, and their edges as sharp, as when they were put into the ground. Our examination extended four miles: and, during our examination, we only found one pole that was not quite sound, and that was of a different colour from the "Burnettized" poles, and it had not any mark upon it. The spurs to two posts were quite rotten, but the posts themselves were hard, and their edges also sharp and hard, so that the probability is, that the spurs have not been prepared.

*Winchester Station,  
24th February, 1849.*

his  
(Signed) SAMUEL ✕ REEVES.  
mark.  
WM. WATKINS.

N.B.—These men, Reeves and Watkins, are constantly employed, and have been for years past, to keep the electric telegraph poles, wires, &c., in good order. They are servants of the Electric Telegraph Company.

## D

SIR: *Millicoll, 28th February, 1849.*

I beg to inform you that I have found iron and lime, and a trace of lead, in the piece of wood you forwarded to me yesterday, but no zinc.

I remain, Sir, your obedient servant,

C. S. JACKSON, Esq.

(Signed) WM. GLASS.

Mem.—This report relates to the rotten spurs alluded to in Reeves and Watkins' Certificate, marked C.

*Electric Telegraph Company, Engineer's Office,  
63, Moorgate-street, London, 22nd March, 1849.*

DEAR SIR:

In accordance with your instructions, I beg to say I have examined the posts and poles from Bishopstoke to about a mile and a half towards Winchester. I found them sound and in good condition. I have not yet examined any other part of the line myself, but I understand that the timber on those parts which have been examined is generally in a satisfactory condition.

This note, as you desired, I have addressed to you.

I am, dear Sir, your obedient servant,

To G. P. Bidder, Esq., C. E.

(Signed) W. H. HATCHER.

## HOP-POLES.

SIR: *Brenchley, Kent, 22nd February, 1845.*

I have been Bailiff to Henry Westcar, Esq., more than eight years, and have used Sir W. Burnett's composition for preserving hop-poles and other wood every year; I find it does much good to all soft woods, such as willow and alder. I have used these sorts of wood unprepared, and could not get them to stand more than one year without fresh sharpening. By using Sir W. Burnett's composition they will stand three years. It will much improve all sorts of wood. I think it most applicable to the soft kinds, but if all the other sorts of wood were to soak longer, I think it would



*Testimonials as to*

have the same effect. I have prepared timber for a *wheat frame, posts and rails*, and find it to answer extremely well.

I am, Sir, your humble servant,  
To the Secretary of Sir W. Burnett's Patent. (Signed) JOHN SIMES.

SIR :

*Brenchley, June 17th, 1848.*

I hope you will excuse me for not answering your note before.  
We have used Sir William Burnett's Fluid for seven years, and find it to be a great preservative for Hop-poles, and it answers our purpose very well; our land is stiff, and we require small poles, such as 10 feet poles, and after they have been soaked they will stand three years without losing the *sharp*; and if we do not soak them, a good many of them will break the first year. Some of my neighbours are going to adopt the same plan.

Yours respectfully,  
EDWIN SIMES, for

To the Secretary of Sir W. Burnett's Patent. H. WESTCAR, Esq.

GENTLEMEN :

*Brenchley, March 28th, 1849.*

I have seen, at Henry Westcar's, Esq., in our parish, some of your Patent Composition for preserving of Hop Poles: they inform me it is of great value, and I feel inclined to try eighty pints of the Patent, if you will forward it by the South Eastern Railway to Paddock Wood. Direct to Mr. G. O. Thirkell, Park Farm, Brenchley. Please to send it as soon as possible, and inform me when you have sent it.

I am, Gentlemen, yours respectfully,  
(Signed) G. O. THIRKELL.

**PROTECTION OF WOOD FROM FIRE.**

*Copy of a Letter addressed to SIR WILLIAM BURNETT, by order of the LORDS COMMISSIONERS of the ADMIRALTY, respecting the application of his Patent process to the protection of Wood from FIRE.*

SIR :

*Admiralty, 19th June, 1844.*

My Lords Commissioners of the Admiralty having caused experiments to be made to test the incombustibility of woods, when saturated in your solution, I am commanded by their Lordships to acquaint you that it has been ascertained that the soft woods, such as yellow pine and other deals, both foreign and English, saturated in solution prepared in certain proportions, when exposed to the immediate contact of iron heated to a blood-red heat, did not at all ignite into flame, whereas unprepared wood of the same kind, burst into flame immediately.

The same effects however are not produced in the same degree by the same process upon the hard woods.

I am, Sir,  
Your most humble servant,  
(Signed) JOHN BARROW.

Sir WILLIAM BURNETT, K.C.H.

**ADDITIONAL TESTIMONIAL AS TO THE PROTECTION OF WOOD FROM FIRE.**

Communicated by order of the Right Hon. Lord Stanley, Secretary of State for the Colonies, to the Governors of the North American Colonies.

*Extracted from the "Bermuda Royal Gazette" of the 21st October, 1845.*

"BERMUDA.—The following portions of a despatch recently received by His Excellency, the Governor, we lay before our readers. The specimens of the prepared wood and the Pamphlet alluded to, will be placed, the former in the Museum, and the latter in the Library."—*Ed. Bermuda Royal Gazette.*

(Circular.)

SIR :

*Downing-street, 30th August, 1845.*

The recent calamitous fires at Quebec, have led Her Majesty's Government to consider the propriety of making known in the Colonies, where timber is largely if not entirely employed in the construction of houses, the success which has attended the inventions in this country for the preservation of wood from ignition, as well as from dry rot.

I accordingly inclose for your information the copy of a despatch, with its annex-

ures, which I have this day addressed to the Governor of Canada on the subject. Although the circumstance which has led to that communication has a more direct relation to Canada, it may, to a certain extent, be considered applicable to the other Provinces, and I have to instruct you to adopt such measures as may appear best calculated to effect the object in view. I have, &c.

Governor Reid, &c. &c. &c. (Signed) STANLEY.

MY LORD: *Downing-street, 30th August, 1845.*

I enclose herewith the copy of a letter from Sir William Burnett, suggesting the importance of employing, in the rebuilding of those portions of Quebec, which have been destroyed by the late calamitous fires, wood prepared according to his plan.

I also enclose the copy of a letter from the Secretary of the Admiralty, forwarding reports from officers of the Dockyard at Portsmouth of the results of experiments made by them to test the efficacy of this invention in preserving timber from ignition, together with a statement from the Secretary of the Patentees, showing the cost per load of preparing wood for purposes of building.

In addition, I inclose the copy of a letter from Mr. Jones, suggesting the applicability of this prepared wood to the formation of roads in the western division of Canada, and proposing that a portion of the sum granted by Parliament for the relief of the sufferers by the fires at Quebec, should be expended in the purchase of the requisite machinery, and its conveyance to Canada. This gentleman has lately returned to the province, and would be prepared to afford to your Lordship, any explanations which you might require on the subject.

Considering the importance of any measure which has a tendency to diminish the risk of fires in a country in which, as in Canada, wood is extensively used for the construction of dwelling-houses, I think it right to bring these suggestions under your Lordship's notice, in case you should think them proper objects either for expending upon them a part of the sum lately voted by Parliament for the relief of the sufferers by the fires at Quebec, or for making them the subject of an application to the Provincial Parliament.

I have, &c. &c.

To the Right Hon. Lord Metcalfe, &c. &c. (Signed) STANLEY.

SIR: *Admiralty, 14th August, 1845.*

In reply to your letter of the 9th instant, with its inclosure from Sir William Burnett, I am commanded by my Lords Commissioners of the Admiralty to transmit to you, for the information of Lord Stanley, a copy of a Report from the officers of Portsmouth Yard, upon the effects of his Solution applied to the purpose of preventing ignition in timber, or rather to prevent it breaking into flames. In consequence of that report, my lords have ordered the bulkheads in the holds and magazines in Her Majesty's Ships to be fitted with timber so saturated, and it is also applied largely to the various buildings in Her Majesty's Dockyards.

I send for Lord Stanley's further information, a copy of a statement of the price per load of preparing timber for building purposes.

I am, &c.,

(Signed) W. A. B. HAMILTON.

Geo. Wm. Hope, Esq., &c. &c. *Secretary.*

SIR: *Portsmouth Yard, 13th March, 1844.*

With reference to your directions of the 1st ultimo, to make experiments as to the degrees of prevention against ignition into flame, which timber saturated with Sir William Burnett's Solution affords comparatively with wood of the same kind and unprepared, we have the honour to state, that we have very carefully instituted a series of experiments on this subject, of which the following are the results.

[A portion of the experiments were made by placing the prepared and unprepared specimens in one of the furnaces of the metal mills, in which the results were decidedly in favour of the prepared woods; which resisted that intense heat much longer than the unprepared. The experiments were then continued as follows.]

Red Pine (Canada), the red hot iron placed over both—the unprepared burst into flame immediately,—the prepared gave no symptoms of flame, and the iron became cold without its inflaming.

Elm (Canada) placed in hot pots containing the copper cakes lately ladled out of the refining furnace. The unprepared ignited into flame in half a minute. The prepared into a very much smaller flame in two minutes and a quarter.



*Chemical Experiments on Prepared Timber.*

Yellow Pine (Canada) placed in the cake pots similarly to the beforementioned. The unprepared burst into flame immediately. The prepared was watched for twelve minutes, but burst not into flame at all. The heat was very great.

A second experiment was tried on this timber, by placing red hot iron on it. The unprepared ignited immediately into flame. The prepared not at all.

It appears from the above experiments, that some of the prepared woods (especially the Canada Yellow Pine) have resisted ignition into flame to an extraordinary degree.

We are of opinion, that Yellow Pine Timber prepared in this way might be used most beneficially, not only for magazines and light room bulkheads, but also for all the bulkheads of a ship. There appears to be nothing in the Solution calculated to injuriously affect the health of the crew, and if, by preparing Yellow Pine Timber in this way, it might be made as durable as the timber generally used for bulkheads, it would be found to possess the double advantage of preserving the timber and preventing its ignition into flame. The Solution used in the above experiments was about eight times the ordinary strength.

We remain, &c.,  
R. BLAKE. J. WATTS.  
(Signed) F. STURDIE. J. OWEN.

SIR:

Portsmouth Yard, 25th May, 1845.

With reference to your memo. 20th March last, directing me to report whether we propose that bulkheads should be prepared with Sir William Burnett's Solution of the same strength as that used in the experiments described in our letter of the 16th March last, that is, eight times the usual strength, and if so, what would be the expense of fitting a line-of-battle ship in that manner.

The following is the comparative expense of fitting the bulkheads of the hold of a line-of-battle ship with ordinary timber unprepared, and with Yellow Pine and Riga Fir prepared with Solution of one pound of Chloride, to two gallons of water.

|                                                                                               |           |
|-----------------------------------------------------------------------------------------------|-----------|
| Bulkheads &c. in hold, of English oak, 3 in. thick, 2,760 cubic feet                          | £ s. d.   |
| Do., Yellow Pine, 3 in. thick, 2,760 cubic feet, including cost of preparation                | 966 0 0   |
| Difference in favour of Yellow Pine                                                           | 577 18 0  |
| Bulkheads &c. in hold of Riga Fir 3 in. thick—2,760 cubic feet, including cost of preparation | £ 388 2 0 |
| Difference in favour of Riga Fir                                                              | 646 18 0  |
|                                                                                               | £ 319 2 0 |

We have, &c. &c.,  
(Signed) R. BLAKE. J. WATTS. J. OWEN.

### *Chemical Analyses of and Experiments on various specimens of Burnettized Timber.*

From THOMAS GRAHAM, Esq., M.A., F.R.S., L. and E., Professor of Chemistry, University College, London.

After making several experiments on wood prepared by the Solution of chloride of zinc for the purpose of preservation, and given the subject my best consideration, I have come to the following conclusions.

The wood appears to be fully and deeply penetrated by the metallic salt: I have found it in the centre of a large prepared paving block.

The salt, although very soluble, does not leave the wood easily when exposed to the weather, or buried in dry or damp earth. It does not come to the surface of the wood by efflorescence, like the crystallizable salts. I have no doubt, indeed, that the greater part of the salt will remain in the wood for years, when employed for railway sleepers or such purposes. This may be of material consequence when the wood is exposed to the attacks of insects, such as the white ant in India, which I believe would be repelled by the poisonous metallic salt.

After being long macerated in cold water or even boiled in water, thin chips of the prepared wood retain a sensible quantity of the oxide of zinc; which I confirmed by Mr. Toplis's test, and observing that the wood can be permanently dyed from being charged with a metallic mordant.

I have no doubt, from repeated observations made during several years, of the valuable preservative qualities of the Solution of chloride of zinc, as applied in Sir W. Burnett's process; and would refer its beneficial action chiefly to the small quantity of the metallic salt which is permanently retained by the ligneous fibre in all circumstances of exposure. The oxide of zinc appears to alter and harden the FIBRE of wood and destroy the solubility, and prevent the tendency to decomposition of the azotised principles it contains, by entering into chemical combination with them.

University College, 25th Oct. 1845.

(Signed)

THOMAS GRAHAM.

EXTRACT from "ILLUSTRATIONS OF THE THEORY AND PRACTICE OF VENTILATION, &c. &c." By D. B. REID, M.D., F.R.S.E., late Vice-President of the Society of Arts for Scotland, and Senior President of the Royal Medical Society, Edinburgh. (Pages 73, 74; subject, DRY ROT.)

In all cases where there is either peculiar exposure, a difficulty in obtaining constant and free access to timbers, or a desire to give the highest protection, the materials should be subjected to those agents whose antiseptic powers tend to oppose all incipient vegetation. Among these the muriate of zinc, introduced by SIR WILLIAM BURNETT, which I have used on different occasions, and which from the specimens I have seen is the most powerful of those materials that DO NOT AFFECT THE TEXTURE OR OTHER QUALITIES OF THE WOOD.

Many oily antiseptics, though offensive from their odour, are also effectual in preventing Dry Rot; but, as yet, I have not seen any specimens of wood or canvas that have resisted such trying circumstances as those that were protected by the muriate of zinc.

Experiments made by Mr. Glass, chemist to the Proprietors of Sir W. Burnett's Patent, to ascertain whether or not, the Solution of chloride of zinc had penetrated to the centre of a log of oak, 14 feet long by 18 inches in diameter, prepared in the hydraulic apparatus in daily use at the Station, Millwall, Poplar.

1. The log was divided into two pieces by a saw.
2. A quantity of wood was then removed by an auger from the centre of one of the ends of the newly cut pieces.
3. The portion of wood removed by the auger, dried and slowly charred in a porcelain crucible.
4. The charred wood digested in hot nitro-hydrochloric acid, and the Solution obtained filtered.
5. The clear filtrate supersaturated by caustic potash, and the liquid boiled and filtered.
6. To the clear filtrate, a transparent solution of sulphuretted hydrogen, or a current of the gas, well washed, was added. This produced a white precipitate, and was conclusive of the presence of a salt of zinc, and, therefore, proved that the Solution had been forced to the centre of the log of oak.

Experiments intended to prove that chloride of zinc produces with wood a compound insoluble in water.

- A. Some white pine-wood was cut out into thin slips about the size of matches, and one half digested in a Solution of chloride of zinc for four hours, and then carefully dried.
  - a. The unprepared wood dyed in a boiling infusion of logwood (Hæmatoxylin Campechianum). The colour obtained was a reddish yellow.
  - b. The one-half of the wood so dyed was boiled in water. The colouring matter was nearly all removed,—the colour left being yellow.
  - c. The prepared wood was dyed as in a. A dark reddish brown colour was produced.
  - d. A portion of the prepared wood so dyed was boiled in water. The excess of colouring matter was removed, yet the same shade of colour was left as in c.
  - e. Another portion of the prepared wood was boiled in water, and then dyed as above. The same colour was produced as in c.
  - f. Another portion of the prepared wood treated as in e, was boiled in water. The same colour as in c, was left on the wood.



- B. 1000 grains of the interior of a Burnettized beech rail used for some time on Prosser's Experimental Railway at Wimbledor Common, cut into very thin pieces, yielded 7 grains of oxide of zinc, of which only 2½ grains could be dissolved by boiling water. This small proportion (being an excess of chloride of zinc) had not combined with the wood, and therefore was soluble in water.

3rd October, 1845.

\* \* The beech rails prepared by Burnett's Patent, and used on Prosser's experimental railway, were formed from timber cut down in May last, and prepared and laid down in the same month.

A Certificate from a gentleman who witnessed the above experiments, and specimens of the dyed wood, may be seen at the Office, 53, King William-street, City.

#### EXTRACTS FROM A REPORT OF AN OFFICER OF ENGINEERS,

*Commissioned by the French Government to examine and report upon the merits of*

SIR WILLIAM BURNETT'S PATENT PROCESS.

*Report upon the process employed in England for the preservation of Wood, Canvas, and Cordage.*

Many researches have been made until now, more particularly within the last few years, to find a process which will preserve woods from the rapid decay to which they are subject in the universal uses to which they are employed.

Amongst the numerous means that have been submitted to the public, there are three worthy of being cited, which appear to have some chances of success.

[The writer then gives a brief account of other methods adopted for the same purpose, with objections to them, and proceeds:]

The process of which I have to give an account, is that of Sir William Burnett, Director-General of the Service of Health in the English Navy, which has been proved by many years' experience; and if it does not resolve the problem completely, it has at least, above all the others, some positive advantages, which render it worthy of attention.

This process consists in introducing into the wood, by means of great pressure, a solution of chloride of zinc, and in replacing as much as possible the sap by this solution. \* \* \*

I have seen some slender plank and some pieces of canvas, which, after having been submitted to the preparation, had been placed during many months upon the soil of a very damp pit, by the side of others of the same dimensions obtained from the same plank, and some other pieces of canvas cut from the same piece, which had not been prepared. The first were perfectly sound; the second showed evident traces of deterioration—some parts were even completely rotten.

The intimate contact of a rotten piece has not any effect upon the prepared piece, as has been proved to me by the result of an experiment made to this effect, by the principal surgeon of the arsenal at Portsmouth.

The solution of chloride of zinc possesses two other important properties:—1st, it renders the wood very difficult to inflame; and, 2nd, if in a wooden vessel it be mixed with the water of the hold, (bilgewater) it preserves it for a long time from corruption, and it also prevents the disagreeable smell, which is one of the plagues of mariners. This last property has been profitably used on board the royal yacht 'Victoria and Albert;' and I saw at Southampton the packet-boat 'Oriental,' of 450-horse power, on board of which this process has been used with success. As to the first property, it is not less precious; and many great misfortunes may be avoided by using it in the construction of roofs, sheds, &c.

To give an account of the action of chloride of zinc upon wood—the action to which its preservative effect is due—I have, myself, made an experiment, of which here is the summary.

Some small pieces of prepared pine wood and some others of the same kind unprepared, were plunged separately into a decoction of logwood, and boiled during a quarter of an hour; after which they were taken out and washed.

The colour had scarcely taken upon the unprepared wood; that, on the contrary, which had been impregnated with chloride of zinc had taken a very deep red-brown colour.

Some pieces of wood like the preceding, after having been dyed and washed in the same manner, were plunged during a quarter of an hour in boiling water. The

colour of the unprepared wood was almost entirely removed :—that of the prepared was scarcely changed. In fine, some small pieces of prepared wood, in all respects like those referred to in the preceding experiments, have been first washed, then plunged into boiling water, in which they were kept during a quarter of an hour, after which they were dyed as before, and then washed in boiling water. Nevertheless the colour remained the same as if all these washings had not been given to them.

It appears right to conclude from these facts that the chloride of zinc combines chemically with the ligneous matter of the wood, and that, although this salt is soluble in water to an enormous degree, the compound which it forms with the wood is perfectly insoluble even in boiling water.

There is, then, no reason to fear that a piece of wood or a sail once prepared will lose, by a long continuance in water, the qualities that have been communicated to them by the preservative salt; and it may be conceived that the ligneous matter, having changed its nature, becomes capable of resisting the causes of destruction which it had not the power of resisting before.

As to the expenses that would be occasioned by the use of Sir William Burnett's process, they are of little consequence if we consider the saving that would result to the Navy by the use of an efficacious process of preservation; and there is no good in being prejudiced against it.

[After some details as to the cost of the process and a description of the apparatus used for the purpose in the Government Dockyards in England, and at the Works of the Proprietors of the Patent at Milwall, Poplar,—he adds]

An interesting question which presents itself here, is to know in what state the wood ought to be submitted to the preparation. Ought it to be green or perfectly dry?

In my opinion the wood, to be submitted to an efficacious preparation, ought to be that recently cut; for then all its pores are open and the sap is more easily drawn from it and replaced by another fluid; a very dry wood, of which the pores are so close that, in a manner, they disappear, would offer great difficulties to such a preparation; and there are other hard woods with which it would be impossible.

The wood employed then, ought to be recently cut; besides, it ought to be reduced to its smallest dimensions. This is economical, for the cube of it is considerably reduced; moreover, one is much more sure of completely saturating the pieces of which the square is become much less.

I saw in a store at Chatham, the members of a frigate intended soon to be put upon the stocks. These members, after being prepared by Sir William Burnett's process, had been deposited under a shed for six months for the purpose of drying before being used.

This time, it appears, is sufficient to prevent any inconvenience in employing prepared wood; as it dries so well that the ordinary working (*i.e.* planing down) is sufficient when they come to set up the vessel with crooked timbers.

As to the cordage, their thickness being comparatively small they can be prepared a long time before they will be wanted for the storehouse.

In case it should be ascertained that with the precautions prescribed by the English Admiralty, they succeed in completely saturating wood of large dimensions, it would become interesting to apply the process for the preservation of wood for masts; and, in that case, to avoid a useless expense, it would be expedient, at first to carry the dimensions of the cylinder to what it ought to be for the reception of the largest piece of wood used for a mast. At Chatham, at the time when I visited that arsenal, the establishment of another cylinder 95 English feet long, was in contemplation for this purpose.

I will conclude by stating concisely the principal results to be drawn from the preceding considerations.

The process of Sir William Burnett is really efficacious for the preservation of wood, canvas, &c., when they can be saturated completely with the preservative liquid.

The process is easily employed when once the necessary apparatus is established; and it is attended with an insignificant expense, if we compare the figure with that which represents the value of the woods employed.

The example given by the English Admiralty is a powerful argument in favour of the adoption of this process; if not in a general manner, at least for wood of moderate and small dimensions.

(Signed)

A. M. MANGIN,

*Ingenieur de la Marine.*

November, 1845.





June, 1851.]

SIR WILLIAM BURNETT'S  
PATENT PROCESS,  
FOR THE PRESERVATION OF  
TIMBER, CANVAS, CORDAGE,  
COTTON, WOOLLEN,  
ETC., FROM  
DRY ROT, MILDEW, MOTH, AND DECAY.

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PART II.  
PROSPECTUS, AND TESTIMONIALS AS TO  
**PREPARED CANVAS, WOOLLEN, &c.**

---

PART I., *as to* PREPARED TIMBER, &c., and

PART III., *as to the* PRESERVATION of ANIMAL SUBSTANCES,  
*and the* PURIFICATION of BILGE-WATER, *with Reports on*  
SIR W. BURNETT'S DISINFECTING FLUID,

MAY BE OBTAINED, ON APPLICATION AT THE OFFICE.

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STATION  
FOR HYDRAULIC APPARATUS AND TANKS,  
FOR THE EXPEDITIOUS PREPARATION OF MATERIALS,  
MILLWALL, POPLAR, NEARLY OPPOSITE GREENWICH.  
OFFICE, 53, KING WILLIAM STREET,  
LONDON BRIDGE.



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## PROSPECTUS.

THE following are some of the peculiarities and advantages of Sir William Burnett's Patent process.

### ITS EFFECTS ON WOOD.

It hardens and improves its texture. It enters into permanent chemical combination with the ligneous fibre ; and does not come to the surface of the wood by efflorescence, like other crystallisable salts ; and no amount of washing or boiling in water will remove the chemical compound so formed.

It preserves wood and other articles from the adherence of animal and vegetable parasites, and also from the attacks of insects.

It completely preserves wood from *wet* and *dry* rot.

It renders the wood perfectly unflammable, when used of a certain requisite strength.

(See Reports, from S. M. Peto, Esq., M.P., R. B. Dockray, Esq., C.E., Professors Graham, Brande, and Cooper, Part I., p p. 5, 14, 15.)

### ITS EFFECTS ON CANVAS, CORDAGE, COTTON, ETC.

The Preparation preserves these articles from mildew and rot. It renders them more pliable ; does not in the slightest degree discolour them ; and washing or boiling in water will not remove the combination from their fibres.—(See Testimonials, from Professors Brande and Cooper, Part II., p p. 6, 7.)

### ITS EFFECTS ON WOOLLEN.

Woollen prepared by this process will be preserved from mildew and rot : it will not be attacked by moths ; and washing or boiling will not remove the combination from it.—(See Testimonials, Part II., from C. Toplis, Esq., p p. 7, 8 ; and Mr. T. Morton, p. 28.)

### ITS EFFECTS ON ANIMAL MATTER.

It is used for the preservation of anatomical subjects ; and green hides are effectually preserved from decomposition, by being subjected to the process.—(See Testimonials, Part III., from W. Bowman, Esq., F.R.S.; Professor Sharpey; W.V. Pettigrew, Esq.; Richard Partridge, Esq.; and James Murray, M.D.)

### ITS EFFECTS ON BILGE-WATER.

It completely neutralizes the offensive effluvium arising from bilge-water on board ships.—(See Testimonials, Part III.)

### ITS EFFECTS ON METALS.

IRON or other metals are not oxidated or dissolved, either when immersed in the Solution, or imbedded in wood prepared in it.—(See Testimonial, Part I., from J. Mitchell, Esq., C.E., p. 12—Part III., W. Bowman, Esq.; and W. V. Pettigrew, Esq.)



The Testimonials in the following pages—the originals of which may be seen at the Office in King William-street, City—incontestably prove the great value of Sir William Burnett's process, and its superiority over every other.

The process is comparatively inexpensive, and cannot by possibility endanger health, either in its preparation or in its application. It has been tested for a series of years past, by order of the Lords Commissioners of the Admiralty; it is now in extensive use in Her Majesty's Dockyards, for preserving all kinds of timber for ship-building and other purposes, as well as for the preservation of canvas, and the purification of bilge-water in Her Majesty's ships.

Numerous railway and other public companies, noblemen, private gentlemen, ship-owners, &c. &c. &c., are using the Patent for the like purposes, in all parts of Great Britain and Ireland; many of whom have borne testimony to the efficacy and economy of the process.

### Terms for granting Licences

#### TO USE THE PREPARATION:

For its use for the whole term of the Patent, one payment of *three shillings* per cubic foot, according to the internal area of the Tank desired.

Or a rental of one shilling per cubic foot per annum, agreeably to the aforesaid measurement, for the same term. In either case the Proprietors undertake to supply the material at *one shilling* per pound; one pound being sufficient for ten gallons of water.

Or, if preferred, Licences will be granted for the use of the Patent Preparation, without any payment on the area of the Tank; but, in this case, the material will be *1s. 6d.* per lb.

Payment in all cases being required by anticipation.

### Charges

#### FOR PREPARING MATERIALS AT THE STATION OF THE COMPANY, BY THE HYDRAULIC PROCESS:

|                                                                           |    |    |               |
|---------------------------------------------------------------------------|----|----|---------------|
| For TIMBER, round or square, including Planks, Deals, Hop-                | s. | d. | } per Load    |
| poles, Paving-blocks, and Railway-sleepers                                | 12 | 0  |               |
| <i>Landing and Loading — per Load.</i>                                    |    |    |               |
| „ Park-palings, Cabinet-work, Wine and other Laths,—<br>as per agreement. |    |    |               |
| „ CANVAS                                                                  | -  | 3  | 6 per Bolt.   |
| „ Sails, Tents, Awnings, Rick-cloths, &c.                                 | -  | 0  | 3 per Sq. Yd. |
| „ Corn and other Sacks                                                    | -  | 0  | 6 each.       |
| „ White Yarn                                                              | -  | 4  | 6 per cwt.    |
| „ NETS, exceeding 28 lb, not exceeding 56 lb                              | -  | 4  | 0 each.       |
| „ „ 56 „ „ 84 „                                                           | -  | 6  | 0 „           |
| „ „ 84 „ „ 112 „                                                          | -  | 8  | 0 „           |
| „ WOOLLENS,—as per agreement.                                             |    |    |               |

Further information may be obtained, Specimens seen, and special Terms entered into, when the quantity of Materials to be Burnettized is large,—on application to Mr. JACKSON, Secretary, at the Office, or at the Station.

## PART II.

### TESTIMONIALS

AS TO

*Prepared Canvas, Cordage, Woollen, &c.;*

*The efficacy of the Solution in the Protection of  
Woollen from Moths;*

ETC. ETC.

SIR : *Coast-guard Office, 9th April, 1850.*

I herewith forward for your information copies of communications received from the Commander of H.M.R. Cr. *Vigilant*, and Mr. Gordon, of Rotherhithe, relative to the comparative efficacy of Sir W. Burnett's process in preserving canvas from mildew and rot.

I am, sir, your obedient servant,

CHARLES S. JACKSON, Esq.,  
Secretary to Sir William Burnett's Patent,  
53, King William-street, City.

*H.M.R. Cr. "Vigilant," April 2nd, 1850.  
Tobacco Ground, Rotherhithe.*

SIR :  
I have the honour to reply to your letter and to acquaint you, I have carefully examined the sails supplied to this cutter, which have been in use varying from one to three years, made from canvas which had undergone the process of Sir W. Burnett for the prevention of mildew and rot. And I feel warranted in stating, to the extent of my practice in the ordinary course of wear and tear, that the process is successful in preserving canvas from mildew or rot.

I have the honour to be, Sir,

Capt. A. ELLICE, R.N.,  
Comptroller-General, Coast-guard.

Your most obedient humble servant,

(Signed) RICHD. GOWLLAND.

SIR : *Rotherhithe, 25th March, 1850.*  
In answer to your inquiries as to the advantage to be derived from the use of Sir William Burnett's process, in preparing sailcloth for the vessels of H.M. Customs, I beg to report, that in no case when sails have been returned to me condemned have I found that they have suffered in the least degree from mildew or rot, but that they were worn out by the ordinary friction.

I am therefore decidedly of opinion, the process above alluded to prevents canvas from becoming attacked by mildew and rot, as it has been universally adopted in the service, from February, 1846, to the present time, with success.

I am, Sir, your obedient humble servant,

Capt. ELLICE, R.N.,  
Comptroller-General, Coast-guard.

(Signed)

WM. GORDON,

Sailmaker.

*Naval Dockyard, Devonport, 23rd April, 1850.*

DEAR SIR WILLIAM :

The canvas which was put up, to be exposed to all weathers, in September, 1847, has been taken down, and laid aside to be taken care of. Lord John Hay and I, with the master sailmaker, inspected it; and Lord John will make his report. But were further proof required, there could have been none so conclusive as this, in favour of the prepared over the unprepared.

I am going to Scotland for two or three weeks; on my return by the way of London I will call at your Office.

Yours, very respectfully,

To  
Sir WILLIAM BURNETT, K.C.B., &c., &c., &c.  
Admiralty.

(Signed) JAMES HENDERSON,

Master-Attendant.



*Testimonials as to*

MY DEAR SIR:

*Southsea, 18th July, 1850.*

In about August, 1844, I found two sails that had been made for a sloop of war, nearly or quite twenty-five years. As they appeared perfectly good, and being in want of a suit of sails for the *Reynard* lighter, I had these sails converted to that purpose, having them saturated with Sir William Burnett's solution.

The particulars of this transaction will be found in the sail-loft, and at the rigging-house of Chatham Dockyard. In 1846, when I left the Yard, the sails were as good as when first made, although they had been bent from the time they were completed; and I have reason to believe the same are in use to this day, having given most particular directions to watch the wear and tear of them.

My motive was to have a test under my own inspection, frequently noticing their condition, and to have a sample to offer, whenever called upon for a report, although my opinion had been offered freely, years previous to this time, from actual observation of repeated tests, under every variety of circumstances to which canvas could be exposed. It was not, therefore, for my own satisfaction, but for the information and inspection of all who entertained any doubt of the preservative quality of Sir William Burnett's Solution on canvas.

The dates are from memory, consequently may not be quite correct, but the facts are as herein detailed. The master sailmaker and leading man of riggers will at any time furnish dates, and particulars as to wear and tear.

I am very faithfully yours,

To  
Sir W. BURNETT, K.C.B.,  
Somerset House.

(Signed) F. W. R. SADLER, *Comm., R.N.,*  
*Late Master-Attendant of H.M. Dockyard,*  
*Chatham.*

## REPORT by Professors BRANDE and COOPER.

*London, 24th May, 1844.*

We have examined the action of chloride of zinc, as applied under Sir W. Burnett's Patent for the prevention of dry rot, in reference to the cause of its efficacy, and its influence upon the strength of the fibres of canvas or sail-cloth.

We are of opinion that its efficacy depends upon the chemical combination of the oxide of zinc with the ligneous fibre. We have found that canvas prepared according to the specification of the Patent, retains oxide of zinc in chemical combination after it has been repeatedly washed and boiled in water, so as entirely to free it from all merely adhering salt of zinc; and that under such circumstances, when the fibre is burned, the ashes yield abundant evidence of the presence of oxide of zinc.

In reference to the strength of the prepared, as compared with the unprepared fibre, we are of opinion that the Patent process does not tend to weaken its texture. We have unravelled pieces of prepared and unprepared canvas cut from the same piece, and have determined the weights requisite to tear their respective threads asunder, and we have not been able to detect any material difference in the average results of our trials.

(Signed) WM. THOS. BRANDE,  
JOHN THOS. COOPER.

## FURTHER TESTIMONIAL.

SIR: *London, 14th October, 1844.*

On examining the specimens of WOOD and canvas which we prepared according to your specification about six months since, and which have remained in damp cellars during the whole of that period, and on comparing them with other specimens which were parts of the same wood and canvas, and which had been similarly exposed without having undergone any previous preparation, we found the specimens of wood not to have suffered any material change,\* but as respects the CANVAS, that which had not been submitted to your process was entirely covered with fungous vegetation, while that which had been prepared by immersion in dilute solution of chloride of zinc, in the manner you direct, was not in the slightest degree so affected.

(Signed) WM. THOS. BRANDE,  
JOHN THOS. COOPER.

SIR: *London, 4th November, 1845.*

We have this day again examined the specimens of canvas and wood prepared according to the specification of your Patent, and which, in the month of April, 1844, we placed in a damp cellar, where they have remained up to this date.

We are now enabled satisfactorily to corroborate the favourable opinion expressed in our former report. The canvas remains amply protected from all fungous vegetation

\* The period of six months being too short for the unprepared wood to become affected.

and rottenness, while a corresponding sample of the same piece, which had not been prepared by immersion in the solution of chloride of zinc, is entirely decayed, being mouldy, rotten, black, and in places resembles tinder.

We have also lately compared the strength of a fibre of a piece of canvas which we prepared according to your specification, in October, 1844, with that of the fibre of the same canvas, unprepared, and find that it has in that respect sustained no injury. We are therefore of opinion that your process will not, after any lapse of time, tend to deteriorate the strength of the fibres of the substances in question.

In regard to the several samples of different species of wood above adverted to, each of which was cut into two, one half being imbued according to the directions of your specification with the dilute solution of chloride of zinc, while the other half was left in its original condition, we have also to make a favourable report, and to repeat our opinion of the efficacy of your process as a preventive of dry rot, and similar sources of decay; the unprepared specimens are manifesting symptoms of decay and mildew, while those which have been protected by your preparation are clean and sound.

(Signed)

WILLIAM THOMAS BRANDE,  
JOHN THOMAS COOPER.

To Sir William Burnett, K.C.H., F.R.S., &c. &c.

GENTLEMEN :

London, 30th July, 1846.

In reference to our former statements respecting the efficacy of Sir William Burnett's Patent process for the preservation of TIMBER, Cordage, Sailcloth, and other materials from decay, we beg to repeat that all our subsequent experience has amply justified those statements. We are of opinion that the process, so far from being in any way deteriorating or destructive, is a preservative of vegetable and animal fibre. The specimens of WOOD and of Canvas which we formerly asserted to have resisted the influence of a damp cellar, in which unprepared portions of the same Wood and of the same Canvas became mouldy and rotten, still remain in a sound and protected condition; and as respects the influence of the preservative process upon Canvas laid up in store, we feel entirely justified in concluding, from the results of our several experiments, that under such circumstances the protected article will always maintain its superiority in resisting decay, and that it will not itself sustain any injury under influences which would mildew, and impair the quality, strength, and texture of unprepared Canvas.

We are, Gentlemen, your faithful servants,

(Signed)

WM. THOS. BRANDE,  
JOHN THOS. COOPER.

To the Proprietors of Sir W. Burnett's Patent.

GENTLEMEN :

Albany-road, 3rd May, 1842.

In compliance with your wishes, I have made some experiments on the chemical agencies of Sir William Burnett's Solution of the Chloride of Zinc, proposed for the preservation of various organic substances from premature decay; the result of which I have now the pleasure of communicating to you.

Assuming, as proved by previous experiments, already made repeatedly, carefully, and jealously, that the process invented by Sir William Burnett exercises a marked effect in preventing premature decay in certain substances, exposed under circumstances more than usually favourable to the generation of rot in such materials; I have not deemed it needful, at the present moment, to re-enter upon the inquiry of its *preservative powers*, either for the purpose of confirming or of invalidating the results of former trials. Admitting, then, that some change is wrought in the properties of the substances submitted to it, I have confined my present labours to the attempt to show, by signs very evident to the senses of all examiners, that the changes brought about in the matters subjected to the action of chloride of zinc are effected by a *positive chemical action*, which is *permanent* in its results.

To make apparent to the eye, even of those not familiar with the character of chemical agencies, that organic matters which have undergone the process recommended by Sir William Burnett, have assumed chemical properties, differing from those which belong to them in their unprepared state, I have subjected specimens of the same materials, prepared and unprepared, to the action, consecutively, of the same dye. The effect has been, uniformly, that the prepared and unprepared specimens have come out of the same dye-colour of different colours; and that when the dye, *unaided*, gives a *fugitive* colour, the colour on the *prepared* cloth is of a much more *fixed* character; and, generally, that the colour on the prepared substance has much greater intensity. Here we have a palpable demonstration that some change has been wrought



in the chemical properties of the fibres of those substances which have been immersed in the solution of chloride of zinc; and the plain and indubitable inference is, that to the new properties thus imparted, the material owes its newly-acquired power of resisting, for a much longer period, those influences which in ordinary cases induce that peculiar decomposition of the organic fibre, commonly designated by the terms "rot," and "dry rot."

Some persons may infer from the fact of the ready solubility of chloride of zinc in water, the salt being in fact deliquescent from atmospheric moisture, that it will be readily washed out of any porous or fibrous substance into which it may have been introduced for the purpose of preserving it; and that then, consequently, the preservative power of the solution will be lost, and the substance be left unprotected against the ordinary causes of decay. Chemists who have given their attention to this branch of the science know, that most of the earthy and metallic salts in solution undergo partial decomposition by the mere immersion in them of animal and fibrous textures; and that the fixedness and variety of colour imparted by the dyer's art, are mainly dependent on this fact. A permanent chemical union takes place between the matter of the fibre and the earthy or metallic base of the salt. That this peculiar action ensues in the process of Sir William Burnett, I have on this occasion demonstrated, also to the eye, by taking the various tissues on which my experiments were conducted, and, after having macerated them in the solution of chloride of zinc, and dried them, I have washed, some simply in cold water, others in soap and water, and, subsequently in hot water, so as to remove, if all were removable from the cloth by re-solution, whatever had been introduced by the preservative process; and even then, on subjecting these washed pieces to the dyeing process, they all came out with the evident indication of having received the chemical action of a mordant; in fact, the colour is usually more uniform, sometimes more intense in the washed, than in the unwashed pieces.\* These facts yield us sufficient proof that the change wrought in the chemical qualities of the materials operated upon in the preservative process are of a *permanent character*, not affected by the subsequent washing out or not of the really superfluous quantity of chloride of zinc, which has been deposited by the process in the interstices of the fibrous structure. The matter of the cloth has entered into chemical union with a portion of the oxide of zinc, and to this new combination we are legitimately to ascribe the new power of the fibre to resist the ordinary causes of decay.

That the cloth has actually gained a permanent accession of matter after immersion in the solution and subsequent washing, I have satisfied myself by the mechanical test of weight; but these proofs are scarcely calculated for popular demonstration.

Notwithstanding the deliquescent nature of the chloride of zinc, when a cloth has been immersed in the solution of it, and subsequently aired, the tissue seems to have acquired a certain repellant power as to water applied to its surface; not that this repulsion may not be overcome, but the cloth has manifestly less disposition to absorb water than before its maceration in the solution.

I have extended my experiments over a variety of material, in order to evidence, as much as possible, the *generality* of the chemical action. In the annexed specimens will be seen the effect on linen, woollen, and cotton; giving in a series the results of the exposure to the same colouring matter, of cloths unprepared, and prepared by maceration in the solution of chloride of zinc; of those which have been submitted to the dye as fully impregnated with the solution, and of those which have been washed from the soluble salt prior to immersion in the dye-vat.

On the whole, then, I conclude, and I think it is demonstrated by the experiments herein recited, that the organic fibres, on exposure to the chloride of zinc, enter into chemical union with a portion of the metallic base of the salt, forming thence a new compound possessed of properties differing from those of the previously uncombined components. One of the most marked, and, beyond question, the most valuable of these new properties induced in the fibre, is the insusceptibility of taking on, in a confined damp atmosphere, the usual series of chemical actions which terminate speedily in the decomposition of the organic structure.

I am, Gentlemen, your very obedient servant,

To the Proprietors of Sir W. Burnett's Patent.

CHARLES TOPLIS.

To the Proprietors of Sir William Burnett's Patent.

GENTLEMEN:

Albany-road, 17th August, 1842.

My first series of experiments on the effects of the chloride of zinc upon fibrous substances, was directed solely to the object of affording ocular demonstration that some *permanent chemical change* in the fibres of the material submitted to its action was

\* These specimens may be seen at the Office, 53, King William-street.

brought about by immersion in the solution. Of the results of these trials I had the honour to transmit you specimens, which were, I believe, amply sufficient to convince any unprejudiced observer. Since then I have, for my own satisfaction, made some few experiments, with a view to determine the *preservative power* of the chloride, under circumstances likely to give considerable confidence in the permanency of the salutary change operated upon the organic structure. I took two separate pieces of the same woollen cloth, one of which had been immersed for forty-eight hours in the solution of chloride of zinc, then dried, and afterwards washed in cold water; the other piece in its ordinary unprepared state; both were then subjected to a similar process of dyeing, in the course of which operation they both *remained in the boiling fluid* for some time (say twenty minutes). The two pieces were subsequently buried in the earth of a melon-frame, and taken thence at the end of fourteen days. The unprepared piece was in a state of complete decay; the prepared piece retained its original strength of texture and colour. These specimens were placed in your hands. I have now the pleasure of sending you two pieces of sail-cloth which have been treated in the same way, and with similar results. The time they remained in the earth was three weeks.

These experiments will, I conceive, go very far to remove any doubts which might be raised as to the *permanency* of the preservative power of chloride of zinc on animal and vegetable fibre; since the boiling in the dye-vat, subsequently to preparation, may well be supposed to have removed from the cloth whatever was left soluble in water, by the previous maceration in the dissolved chloride.

In my own mind, not the smallest doubt exists that a permanent chemical union takes place, as I have before intimated, between the organic fibre and the metallic base of the salt; and that to such union must be ascribed the new power, now so frequently and so satisfactorily ascertained, of resisting decomposition under circumstances well known to induce the premature decay of animal and vegetable fibrous structures.

I have the honour to be, gentlemen, your very obedient servant,  
CHARLES TOPLIS.

FROM G. BUSK, ESQ., EDITOR OF THE "MICROSCOPIC JOURNAL."

DEAR SIR: *Hospital Ship 'Dreadnought,' Greenwich, Jan. 7th, 1843.*

At the request of Dr. M<sup>c</sup>William, I have examined, microscopically, some portions of prepared and unprepared canvas and cloth, which are here with forwarded. They consist of eight or nine specimens.

RESULT OF MICROSCOPIC INSPECTION.

No. 1. *Portions of unprepared Sail-cloth, which had been deposited twelve months in vaults under Somerset House, together with some prepared, and marked No. 7.*

Quite rotten, and covered thickly with mildew, consisting of two species of mucedo, one of a yellowish colour, and the other black. The yellow consisting of minute sporidia and interlaced tortuous, very delicate filaments: the black of larger sporidia, and of straight branched stronger filaments. The sporidia of both are disseminated in great numbers among the fibres composing the threads, which fibres are themselves more ragged and uneven on the surface than those of unaffected threads.

No. 2. *A portion of Canvas unprepared, which was inclosed with No. 3, and sent from Bermuda.\**

Appears to the eye unaffected; but on tearing portions of its interior asunder sporidia of the dark-coloured mucedo are found strongly disseminated among the ultimate fibres of the flax. To prove this, I have inclosed a slide, containing portions of flax from this canvas, from which you will be able to satisfy yourself as to this fact;—one perhaps of some importance, as examinations in this way would be a means of determining as to the condition of sail-cloth, or other similar materials which may be fatally affected with mildew, although outwardly presenting no mark of that disease.

No. 3. *Pieces of Canvas, unprepared, from Portsmouth Dockyard.*

Very much decayed. The mildew on these specimens consist in only one species of mucedo, of a black colour, and probably identical with the similarly coloured one in No. 1.

No. 4. *Portions of prepared and unprepared red Cloth.*

The prepared piece of woollen cloth presents no trace of mildew, externally or internally; but the unprepared piece is very friable, and the fibres of wool in it are as it

\* Portions of the same Canvas were washed thoroughly, and rinsed in scalding water, after which they were placed in a cellar; and, when examined, at the expiration of eight months from that time, the prepared piece was perfectly clean and sound, and the unprepared completely rotted.

\* \* \* These pieces may be seen at the Office, 53, King William-street.



were gnawed or eroded on the surface, and sprinkled over with small bright yellow sporidia of a fungus, the filamentous part of which, if such exists, I have not been able to find.

No. 5. *Canvas, unprepared, marked A.*—The same as No. 1.

No. 6. *Canvas, prepared, marked A.*—No trace of mildew, externally or internally.

No. 7. *Canvas, prepared, which had been exposed with No. 1, in the vaults under Somerset House.*

No trace of mildew, externally or internally. This is a *striking evidence* of the *preservative power* of the preparation which the canvas has undergone, when it is compared with its fellow pieces No. 1.

No. 8. *Portions of sail, from on board the 'Wilberforce,' of prepared Canvas.*

No trace of mildew.

I shall be happy, if you wish it, to prepare slides, containing the proofs of the above statements, and which will enable their verification to be determined with great ease.

I employed a power of about four hundred lines, but one of three hundred would be sufficient.

Believe me, with much respect, yours truly,

SIR W. BURNETT, K.C.H., &c. &c. &c.

GEORGE BUSK.

I do hereby certify, that on the 27th December last, I received from Sir William Burnett two pieces of coarse canvas, and two pieces of line; the latter about an inch in diameter. One piece of the canvas was prepared, and had the letter 'P.' on it; the other was unprepared, and had the corners cut off. The line was marked, by having small pieces of parchment, with the words 'Prepared,' and 'Unprepared,' attached to the centre of each.

These were placed, by Sir William Burnett's directions, in a very damp cellar, and remained there till the 28th of May following, when they were examined. The prepared canvas and prepared line were found perfectly sound, and free from mildew; the unprepared were completely rotten, and covered with mildew.

10th August, 1838.

(Signed) RICHARD GREENING.

And I do further certify, that on the 14th July, 1838, I deposited in the cellar aforesaid, one piece of canvas prepared, and one piece unprepared; one piece of drugget prepared, and a similar piece unprepared. On the 18th of November following, these specimens were examined, when the prepared canvas was found exactly in the same state as when deposited; the unprepared was found covered with mildew, to a great extent, and also the appearance of fungi, with part of the edge rotten.

The prepared drugget was sound as when deposited, without the slightest appearance of decay, while the unprepared was completely rotten, and could not sustain its own weight; covered with fungi, and appeared as if it had been attacked by moths or other insects.

8th February, 1839.

(Signed) RICHARD GREENING.

Particular attention is requested to the following important Documents from the LORDS COMMISSIONERS OF THE ADMIRALTY, relative to some of the trials made at PORTSMOUTH DOCKYARD.

SIR:

Admiralty, 13th July, 1840.

With reference to your letter of the 29th of last month, I am commanded by my Lords Commissioners of the Admiralty to acquaint you, that from the report of the trials of the strength of the Cordage and Canvas prepared with the solution on your plan, as compared with that unprepared, it appears that after both were equally exposed to wet and damp, as well as to the effects of the atmosphere, the prepared Cordage is on the average about one-twelfth stronger,† and the Canvas about two-thirds stronger than the unprepared.

I am, &c. &c.,

SIR WILLIAM BURNETT, K.C.H., F.R.S., &c. &c.

H. E. AMEDROZ,

Pro-Secretary.

† The cordage, in this instance, was submitted to the Solution as Rope, previously tarred;—condition in which cordage cannot derive the full benefit of the Patent. It should be prepared in the state of yarn.

*Copy of a Report forwarded by Sir John Barrow, together with the Report on Cordage, in page 24.*

To the Admiral Superintendent. *Portsmouth Yard, 24th June, 1840.*

Suspended by weights, canvas No. 3. Immersed in the solution two pieces prepared, and two unprepared, which had been placed in a damp cellar for twelve months; when tested, broke at the undermentioned weights:

| Prepared.                         |                   | Unprepared.            |                  |
|-----------------------------------|-------------------|------------------------|------------------|
| Pieces laid open.                 | Pieces rolled up. | Pieces open.           | Pieces rolled.   |
| West                              | West              | West                   | West             |
| broke at 414 lbs.                 | broke at 505 lbs. | broke at 197 lbs.      | broke at 267 lbs |
| Two pieces exposed on the Sheers. |                   |                        |                  |
| Prepared.                         |                   | Unprepared.            |                  |
| West broke at 293 lbs.            |                   | West broke at 266 lbs. |                  |

From the foregoing trials of strength, I am induced to suggest, that it would be beneficial to Her Majesty's service, were all cordage, canvas &c., especially that for store at home, or for foreign service, dipped in this Solution, as it appears in every instance to preserve the articles from the effects of damp, mildew, and premature decay.

I am,

F. W. R. SADLER.

*Master Attendant.*

P.S.—The damp cellar alluded to, is under the Hemp-house, or Store.

(Signed) W. P.

Vide Testimonial in Part I., page 11, for Canvas and Calico tested in the Fungus Pit in Woolwich Dockyard.

*Extract from a Report made by the Commander of H.M. Brig 'Water-witch,' dated at Sea, Sept. 23, 1840.*

Having received from Portsmouth Dockyard, in March 1839, four sails, alternate cloths of which were prepared with Sir W. Burnett's Solution, an old top-gallant-sail being allowed to remain wet for a considerable time, the prepared cloths were free from mildew, while the unprepared were much affected by it.

SIR: *Goswell Mews, London, 29th March, 1841.*

Being desirous of preventing the effects of mildew in canvas employed in some of our manufacture, we procured in January, 1840, a small piece of No. 1 canvas that had undergone your process, and put it with an unprepared piece in a very damp situation, nearly excluded from the air; and on examining these pieces in November last, we found the unprepared piece nearly covered with the usual greenish appearance indicating mildew, and the prepared piece as clear as when deposited. We consider this trial so decided an advantage, that we intend in future that our canvas shall undergo your process.

We are, &c.,

CHARLES MACINTOSH & Co.,

To the Secretary, Burnett's Patent. *Patentees of Waterproof Cloths.*

*Extract of a Letter to Sir William Burnett, from Mr. Byham, Secretary to the Board of Ordnance, dated 19th July, 1841.*

"In reference to the request contained in the latter part of your letter, I beg to inclose a Copy of a Report from the Superintendent of Ordnance Shipping, respecting the fore-sail of one of the Ordnance sloops, prepared by your process."

*Royal Arsenal, Woolwich, 19th April, 1841.*

Captain Soady presents his compliments to Mr. Byham, and in reply to his note of the 3rd instant, requesting to be informed whether any trial or experiment has been carried on under his direction, with cloth, cordage, &c., which have undergone the Anti-Mildew process of Sir William Burnett,—begs to inform him, that in the month of October last, the *Somerset* Ordnance sloop was supplied with a new fore-sail that had undergone the process referred to, and that the trial has answered every expect-



tation; the sail having been exposed to the wet and damp, without exhibiting the least symptom of mildew; whereas a new main-sail, supplied at the same time, and subject to the same exposure, that had *not* undergone the Anti-Mildew process, has become mildewed in several places: thereby justifying the opinion, that the Anti-Mildew process of Sir William Burnett tends materially to the preservation of sail-cloth.

SIR:

21, Salisbury-street, 28th April, 1841.  
Having just come home from H.M.S. *Terror*, I take the liberty of informing you of the success of the sails sent out in us for trial. They proved themselves much superior to the other canvas, and for work are much better, particularly where there is much wet, and that you cannot dry your sails for days together. I am sorry my log is not here, it is at Chatham, or else I could show you a copy of Lieutenant M'Murdo's remark on the same subject.

It was also remarked how we expended the old sail-cloth, and the saturated was never required to be repaired. As an instance,—We wore three main-top-gallant-sails out for one of the other canvas, which was used as a fore-top-gallant-sail, and when we arrived at Hobart Town, it was as good as ever.

If you refer to the last logs sent home from the *Terror* or *Erebus*, you will see the remarks made by the first Lieutenants of both the ships.

Wishing you all success with your trial, and also good to the service,

I have the honour to be, Sir, your obedient servant,

SIR WM. BURNETT, K.C.H., F.R.S., &c.

E. MOLLOY, MATE, R.N.

#### FURTHER TESTIMONIAL.

*in confirmation of the above, respecting the Sails of H.M.S. 'Terror.'*

SIR:

Golden Cross, February 16, 1843.

In reply to yours, inquiring into the wear and condition of the two top-gallant-sails supplied to H.M.S. *Terror*, which had undergone the Patent preservative process, I feel great pleasure in stating it was most satisfactory, and have to regret that all that ship's canvas had not been prepared, particularly the spare canvas, which was nearly all destroyed by dampness, as well as a quantity of small cordage, and woollen stores.

As senior Lieutenant of that ship, I had a very good opportunity of testing it: bending one main-top-gallant-sail, prepared with your Solution, against two fore of the other canvas, the former proving itself far superior, after a very considerable time; the dates, I am sorry to say, have escaped my memory, and as the logs of ships on that station are not transmitted, it will remain, I fear, unproved up to the time they return.

I can only say, that should I at any future time have to do with a sea-going ship, I should request that all the canvas might be prepared.

I have the honour to be, Sir, your obedient servant,

To Sir W. BURNETT, K.C.H., F.R.S., &c. &c. &c.

A. M'MURDO.  
Lieut. Royal Navy.

*Letter from the late Joseph Somes, Esq., M.P., dated London, May 1, 1841.*

SIR:

An awning made of 'Burnettized' canvas, which was supplied to the *Boadicea*, (one of my ships,) in July, 1840, has been in her on a voyage to Ascension, and is now returned in a surprising state of preservation; it being not only in no way discoloured, but actually whiter on both sides than it was when new, and apparently of undiminished strength.

I consider this trial such conclusive evidence of the value of the Patent, that I shall have all my canvas for awnings and studding-sails submitted to Sir William Burnett's process, and you are at liberty to make any use you think proper of this information. The awning may be seen at 35, Broad-street, Ratcliff.

I am, &c.,

To the Secretary of Sir William Burnett's Patent.

JOSEPH SOMES.

*Ship 'Barretto Junior,' London, Nov. 24, 1843.*

Having received orders, on my departure from England in August, 1840, from the owner of this ship to report upon the wear and durability of some canvas of which I had awnings, and one top-mast, and one lower studding-sail made, prepared with Sir W. Burnett's Solution, I can now truly and fairly assert, that during thirty-

five years I have commanded a ship, I never saw better canvas; and through all its trials it never showed the least symptoms of mildew. The awnings were almost constantly in use, and exposed to extreme heat and cold—at Hong Kong, in the summer, the thermometer ranging from  $86^{\circ}$  to  $90^{\circ}$ , and at Chusan, in the winter, the thermometer below freezing, at which time we had them constantly spread and roofed, to keep the snow and rain off; and, when blowing hard, and obliged to furl them wet, in which state they would remain two or three days, with intervals of sun upon them, and when loosed to be again spread, they never showed mildew; and, having been now upwards of three years in almost constant use and wear, they may still be called serviceable awnings.—The studding sails frequently hauled down wet, and rolled up for the same time, showed equally the same good quality as the awnings.

(Signed)

J. MARSHALL, *Master*.

To the Secretary of Sir W. Burnett's Patent.

## FURTHER TESTIMONIAL

*From the late Joseph Somes, Esq., dated London, Nov. 29, 1843.*

I hereby certify that I have had upwards of 23,000 yards of 'Burnettized' canvas in use, as awnings and sails, on board of my ships, in all quarters of the globe—the greater part of which have been in wear more than three years, in India and China; and I find, on their return to this country, that they are invariably free from mildew, and, comparatively, in a good state of preservation. Having experienced such beneficial results from the adoption of Sir W. Burnett's process, I shall use it more extensively, and recommend it with the greatest confidence.

To the Secretary of Sir W. Burnett's Patent.

(Signed) JOSEPH SOMES

SIR: 71, Cornhill, 4th June, 1841.

I beg to express my testimony to the efficacy of Sir W. Burnett's Patent applied to canvas, of which my studding-sails were made in my late voyage to India in the *Bombay*, and which I feel certain will be found of great benefit to the shipping interest in general, particularly in the climate of India, where canvas so quickly becomes heated.

I remain, Sir, your obedient servant,

JOHN FURLEY,  
*Commander.*

To the Secretary of Sir W. Burnett's Patent.

*Extract of a Letter from an Officer on board H.M.S. 'Wilberforce,' dated Accra, Coast of Africa, August 3rd, 1841.*

With regard to the canvas, will you be kind enough to acquaint Sir William that having paid attention to the general wear and condition of the sails, awnings, tents, &c., supplied H. M. Steamer *Wilberforce*, which have undergone the Patent preservative process, I feel pleasure in testifying to the satisfactory state in which they are; although they have been greatly exposed to tropical rains and a vertical sun, and notwithstanding the canvas, being supplied by contract, is of an inferior description to that issued to the Navy. The rain-awnings appear somewhat waterproof, as they certainly are less pervious to rain than common canvas, and would also appear softer and tougher than that which has not undergone the process.

Mr. Forster, the master of the *Wilberforce*, coincides in opinion with what I have stated above, and also tells me that the sail-maker, an old sailor, is decidedly of opinion that the Patent is a perfect preservative against mildew, and that the *Wilberforce* has been placed under circumstances such as completely to test its efficacy.

*Another, from the same to the same, dated H.M.S. 'Wilberforce,' Confluence of the Chadda and Niger, Sept. 19th, 1841.*

The sails, canvas, &c., have been highly satisfactory: however, have nothing to add to my last statement, made in a letter relative to this subject, in which I take some interest.

MY DEAR SIR:

16, Upper Seymour-street, Portman-square, 9th Feb., 1842.

In reply to your question respecting the effect of your Solution upon the sails and awnings of the vessels of the Niger Expedition, the canvas of which was steeped in it before they were made, I have much pleasure in being able to state that they were most effectually preserved from mildew, and this after as severe a trial as canvas could



well undergo, being alternately exposed, during several months, to heavy rains and a burning sun, with the thermometer sometimes at 93°, and generally much above 80°.

I am, my dear sir,

To SIR W. BURNETT, K.C.H., &c. &c. &c.

H. DUNDAS TROTTER,  
Capt. R.N.

We, the undersigned Captain and Officers of the Niger Expedition, on board the *Wilberforce*, having paid attention to the general wear and condition of the sails, awnings, and tents, supplied the vessel, which had been subjected to Burnett's Patent preservative process, feel pleasure in testifying to its efficacy; the canvas generally having been greatly exposed to tropical rains and a vertical sun, and notwithstanding that provided by contract to the ship was of a much lighter description than that issued in the Royal Navy.

The rain awnings would appear to be made somewhat waterproof by the preparation, as they are less pervious to rain than common canvas, and are likewise more flexible and tougher than that which has not undergone the process.

We are also most decidedly of opinion, that the Patent is a perfect preservative against mildew and rot, as is manifestly shown by the present condition of the sails and awnings, they being still good and serviceable; which would, in all probability, had they not been 'Burnettized,' have become rotten and useless.

Given under our hands, on board the *Wilberforce*, at Cape Coast Castle, this 29th day of March, 1842.

|                    |   |                                                                |
|--------------------|---|----------------------------------------------------------------|
| WILLIAM ALLEN      | { | Captain and senior Officer present of<br>the Niger Expedition. |
| WILLIAM ELLIS      |   | Commander of H.M.S. <i>Soudan</i> .                            |
| WILLIAM FORSTER    |   | Master of H.M.S. <i>Wilberforce</i> .                          |
| M. PRITCHETT, M.D. |   | Surgeon of H.M.S. <i>Wilberforce</i> .                         |

\*\* See next page, Lieut. Cockraft's Testimonial respecting a main deck awning of the *Albert*, used on the same expedition.

*Letter from Captain W. Cook, one of the Commissioners appointed by Government for conducting the Niger Expedition.*

DEAR DOCTOR:

H. M. Steamer '*Wilberforce*,' at Sea, 5th April, 1842.

In compliance with your request, I herewith give you my opinion as regards Sir William Burnett's Patent composition for preserving canvas, &c. I do this the more readily, because I have narrowly watched its effects upon the sails of this vessel, during the last twelve months; and I have no hesitation in asserting that, but for the Patent composition, they would long since have rotted from the yards. In confirmation of this, I may state that during the late rainy season, when there was so much sickness on board, I have frequently known the sails to have been rolled up to the yards for many days together, without an opportunity of airing or drying them.

Under the same circumstances, sails made of the best bleached coker canvas, without the composition, would have been destroyed; whereas these sails, though not originally of the best sail-cloth, are still bent and in constant use, without exhibiting the least signs of mildew.

I remain, my dear Sir, yours faithfully,

M. PRITCHETT, M.D., &c. &c.

W. COOK.

Woolwich, 29th November, 1842.

With reference to the sails, awnings, &c. of H.M.S. Vessel *Wilberforce*, which were prepared with Sir W. Burnett's Patent Solution two years since, and which have been, since that period, much used, and greatly exposed to heavy rain, and to the intense heat of the climate of Western Africa;

I have to acquaint you, that the sails, &c., so prepared, continue in a good and serviceable condition, although the sail-cloth in the first place was not of the best quality.

It is also my opinion, that, had not the sails, &c., been so prepared, they must, long ago, have been destroyed, by constant wear and the effects of climate. In further proof of the efficacy of the Patent, I may state that the old fore-top-sail which was used to sweep her bottom after getting ashore in the River Niger, in July last, is still in so good a condition, that a piece of it is now in use as a tarpaulin for the after hatchway.

(Signed) W. H. WEBB, Lt.,  
Commanding Officer of H. M. S. V. '*Wilberforce*.'

SIR: 12, Northampton-square, St. John's-street-road, London, Dec., 1844.

In reply to your inquiry as to how far the sails, awnings, &c., prepared by being steeped in your Patent Solution were preserved thereby, I beg to state that during the two years I commanded H.M. Steam Vessel *Albert*, I had many opportunities of testing its effects, and found in all cases, the result to be very satisfactory.

The awnings prepared by you were subjected to every alteration of atmosphere, being kept spread night and day, both in the dry and rainy seasons (which I considered to be the severest test to which they could have been subjected). These awnings lasted, at least, twice as long as it is possible for unprepared canvas to have done under the same circumstances; and they, when worn out, presented as white and unmildewed an appearance as they did when first put on board. The sails also, which were frequently many days together wet through without being loosed (owing to the incessant rain), never became either mildewed or warm, while a top-sail, made at Ascension of unprepared canvas, became black with mildew from head to foot.—In fact, the prepared sails when repaired with new canvas, presented after a short exposure to the rain a chequered appearance, owing to the new canvas becoming warm and turning black. A new unprepared quarter-deck awning supplied by H.M. Steam Vessel *Kite* was worn out in fourteen months, while a main-deck awning much worn in the NIGER EXPEDITION was subsequently used by me for twenty months, and then became unserviceable almost as much from its being cut up with shot, and torn by being kept spread in tornadoes to preserve the health of the people, as from its natural decay; this awning must have been in use for nearly thirty months, being constantly spread and exposed to rain, sun and damp. This I think is as satisfactory a test of the efficacy of the Solution as can be wished.

I think it necessary further to state that the process gone through, does not in any way thicken the cloth, or render it difficult to handle, it being as soft and pliable, in fact rather more so than unprepared canvas. In conclusion, I should certainly say that a great saving is effected by your invention; and its adoption by vessels, especially those employed in the *African* trade, would be of incalculable advantage to them.

I have the honour to be, your very obedient servant,

(Signed.) MACLEOD B. COCKRAFT, *Lieut.*

*Late commanding H.M. Steam Vessel 'Albert,' on the West Coast of Africa.*

To Sir W. Burnett, K.C.H., &c. &c. &c.

*Copy of a Report forwarded by Sir John Barrow, together with the Report in page 25.*

*Portsmouth Yard, 20th December, 1841.*

*Alpheus* tank vessel's main-sail, half made of canvas, dipped in Sir William Burnett's Solution, the other half of canvas unprepared. The sail was bent February 9th, 1839, and was in constant use until October, 1841. Both sorts were tested in the presence of Captain Sir George Seymour, a Lord of the Admiralty, Mr. Purdo, master attendant, and Mr. Pennell, storekeeper, 15th October, 1841.

|                              | Weight bore | Warp bore |
|------------------------------|-------------|-----------|
| Dipped in solution . . . . . | 156 lbs.    | 178 lbs.  |
| Unprepared . . . . .         | 117 „       | 163 „     |

Canvas No. 3, prepared with Sir William Burnett's Solution, tested against some unprepared from the same bolt; it having been deposited in a damp place for two years and nine months. Tested in the presence of Sir William Burnett, Mr. Henderson, surgeon of the Yard, Mr. Purdo, master attendant, Mr. Brown, assistant master attendant, Mr. Williams, foreman of Portsmouth Yard, and Mr. Taplin, master sail-maker, 5th November, 1841.

#### Prepared with Solution.

|                    |                      |                              |
|--------------------|----------------------|------------------------------|
| On a roller 1 slip | Weight bore 228 lbs. | Warp bore . . . . . 321 lbs. |
| „ 1 „              | ditto 178 „          | „ „ . . . . . 351 „          |
| On a batten 1 „    | ditto 441 „          | „ „ No trial. —              |

#### Unprepared.

|                    |                      |                                   |
|--------------------|----------------------|-----------------------------------|
| On a batten 1 slip | Weight bore 131 lbs. | Warp bore nothing, quite decayed. |
| „ 1 „              | ditto 144 „          | Warp bore . . . . . 74 lbs.       |
| On a roller 1 „    | ditto 253 „          | Ditto no trial. —                 |

(Signed)

WM. PURDO.



*Testimonials as to*

SIR:

*Trinity-house, London, 22nd December, 1841.*

Referring to the letter which I had the honour to receive from you, under date the 16th ultimo, I have much satisfaction in now transmitting to you, pursuant to the directions of this Board, the accompanying copy of a Report, dated the 20th instant, which has been received from their agent at Ramsgate, in relation to the present condition of the sails prepared under your Patent, and which were put on board the Gull-Stream-Light Vessel, in September, 1840.

I have the honour to be, Sir, your very obedient servant,

SIR WILLIAM BURNETT, K.C.H., &amp;c. &amp;c. &amp;c.

(Signed) J. HERBERT,  
Secretary.

SIR:

*Ramsgate, 20th December, 1841.*

I beg to acquaint you that, agreeably to your request, I have examined the sails on board the Gull-Stream-Light Vessel, the which were prepared with Sir William Burnett's Patent Solution, and were put on board in September 1840, since which time they have been kept on the deck, and exposed to the weather; notwithstanding which they are still in as good condition as when first put on board, are free from mildew, and have no appearance of any decay whatever. Unprepared sails, under similar circumstances, would have been in a decayed state, and rendered quite unserviceable.

I am, Sir, your most obedient and humble servant,

JACOB HERBERT, Esq., Secretary,  
Trinity Board, &c.

(Signed) R. DAVIS.  
Agent of the Trinity House.

## FURTHER TESTIMONIAL.

SIR:

*Ramsgate, 16th January, 1844.*

Agreeably to your request, I have again examined the sails on board the Gull-Stream-Light Vessel, and have the pleasure to inform you that they are still in good condition, and free from mildew or any other appearance of decay.

I am, Sir, your most obedient servant,

To CHAS JACKSON, Esq.

R. DAVIS.

SIR:

*Southampton, December 1841.*

I beg to inform you that, having in compliance with your request subjected a slip of canvas three feet long and four inches wide, eighteen inches of which had been saturated with Burnett's Patent preparation, to the action of an extremely damp part of my cellar, from July last for about two months open, and afterwards folded up and subjected to the pressure of an iron weight in the same place, but for some weeks under water which had found its way into my cellar; on examining it recently I find the part perfectly saturated with the composition sound and good, but the part wholly free from the influence of the said composition rotten and easily torn. I therefore do not hesitate to record my most favourable opinion as to the value of the discovery, which seems effectually to destroy the principle of vegetation so productive of fermentation, and consequently of rot, or decay; and I think considerably lessening the probability of spontaneous combustion in sails or ropes on board of ships, unavoidably, at times, under the influence of wet or damp.

Yours truly,

F. W. JERNINGHAM, Esq., Southampton.

W. WARD.

## Memorandum:

*Select Committee Office, Woolwich, 3rd March, 1842.*

Attended this day with Mr. Jackson, and saw deposited in a hole dug for the purpose, close to the outside wall of the old dipping square, Royal Arsenal, near the South Eastern Angle, six pieces of canvas and three pieces of woollen cloth, prepared with Sir William Burnett's Patent preservative against dry rot, mildew, &c., and six pieces of canvas and three of cloth unprepared, previously cut off from the same canvas and cloth. The hole was about four feet deep. The specimens were placed alternately over each other, prepared and unprepared in four heaps two of each sort next the ground under a wooden box without a cover, inverted, the earth thrown in over it. The spot was selected for its damp situation and its exposure to the rays of the sun. Damp and warmth combined being most productive of mildew.

(Signed)

HENRY PALLISER, Captain R.A.,  
Secretary to Committee.

*Prepared Canvas, Woollen, &c.*

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DEAR SIR :

*Woolwich, 9th September, 1842.*

In reply to yours of the 9th, I beg to inform you that the prepared and unprepared specimens of cloth and canvas which were taken out of the hole in the Arsenal, and examined in your presence, were *afterwards washed in plain water and dried.*

They were then, on the 22nd July, put together into a deal box, perforated in several places, and placed in a damp sink, but not in contact with the water.

They will be examined by the Committee at their next meeting.

I remain, dear Sir, your obedient servant,

C. JACKSON, Esq., &c. &c. &c.

(Signed)

HENRY PALLISER.

DEAR SIR :

*Select Committee Office, Woolwich, 23rd September, 1842.*

The specimens of cloth and canvas have been taken up, after having been nine weeks exposed to a damp air subsequent to washing.

*The prepared canvas was clean and uninjured, the unprepared covered with mildew.*

The Committee have made their Report to the Master-General; and the box containing the specimens is in this Office, and open to your inspection at any time until 4 P.M. daily.

I remain, Sir, yours faithfully,

C. JACKSON, Esq., &c. &c. &c.

(Signed)

HENRY PALLISER,

*Secretary.*

OFFICIAL REPORT,

SIR :

*Dated Office of Ordnance, 10th October, 1842.*

Having laid before the Board of Ordnance your letter dated the 8th instant, signifying the request of the proprietors of Sir W. Burnett's Patent to be furnished with a copy of the Report of the Select Committee upon the experiments made in the Royal Arsenal at Woolwich, with canvas and woollen prepared with Sir W. Burnett's Solution, and that they may also be allowed to have the specimens at their Office;

I am directed to acquaint you, that the Report which has been received on the subject of Sir W. Burnett's preparation for the prevention of mildew is FAVOURABLE to the invention. But the Board must decline to furnish you with a copy of it, or with the specimens.

I am, Sir,

C. JACKSON, Esq.,

Your most obedient, humble servant,

Sir W. Burnett's Patent Office.

(Signed) R. BYHAM.

*Pacific Steam Navigation Company's steam-vessel 'Chile,'  
Callao, 13th March, 1842.*

MY DEAR SIR :

It affords me much pleasure to be able to report very favourably of the process of 'Burnettizing' sails, as exemplified by those of the Pacific Steam Navigation Company's vessels *Peru* and *Chile*, more particularly shown in the fore and aft sails, which have been bent ever since the steamers left England (now seventeen months), except at short intervals whilst painting the spars, and during the repairs of the latter vessel. The head-sails, although exposed to the vicissitudes of alternate wet and solar heat, have hitherto had no repairs; and the main-sails have only required canvas to be shifted where the action of the heat and smoke from the funnel had caused deterioration.

For the sails of steam-vessels, where the saving of time in port is of so much importance, and labour so expensive, I consider the application of this invention to be of the utmost utility; as they may be left furled to the yards, gaffs, or stays, with impunity, until required for use in the ordinary course of the succeeding voyage. This will particularly hold good with the coasting steamers of the British Islands, where, unfortunately, the vast importance of having good sails constantly bent, has been so wantonly overlooked in one or two awfully fatal instances.

Your faithful and obedient servant,

To the Secretary of Sir Wm. Burnett's Patent.

GEORGE PEACOCK.

SIR :

*London, 19th March, 1842.*

In reply to your request respecting the effect of Sir William Burnett's Patent Solution upon the sail-covers and lead-lines which were steeped in it, at Boulogne, in the month of June last, I have great pleasure in reporting, that they have been most effectually preserved from mildew, and in every respect in as good condition as when first put on board, and without the least appearance of decay; although the covers have been exposed to all weathers, as well as to the action of steam and smoke, which



*Testimonials as to*

is unavoidable on board merchant steam-ships, and which I consider would not have been the case had they been used, under similar circumstances, in an unprepared state.

I am, Sir, your obedient, humble servant,

To the Secretary of Burnett's Patent.

W. TUNE.

*Master of the Commercial Steam-Packet Company's  
Vessel 'City of Boulogne.'*

DEAR SIR:

12, Water-lane, 19th March, 1842.

I have great pleasure in adding my testimony to that of Captain Tune's, of the efficacy of Sir William Burnett's Patent Solution, and I think shipowners in general would study their own interest, if they would apply it to their canvas and cordage.

I remain, dear Sir, yours, very truly,

J. ROBINSON.

*Agent to the Commercial Steam-Packet Company.*

To the Secretary of Sir William Burnett's Patent.

FURTHER TESTIMONIAL.

SIR:

London, 5th January, 1844.

I beg to inform you that the sail-covers and lead-lines which were steeped in Sir W. Burnett's Patent Solution in the month of June, 1841, have been in constant use on board the *City of Boulogne* steamer up to the present time, and are still in good preservation.

I remain, Sir, your obedient humble servant,

WILLIAM TUNE.

To the Secretary of Sir W. Burnett's Patent.

*Captain of the 'City of Boulogne.'*

The Testimonial of Capt. C. W. M. S. M'Kerlie, late of the Hon. East India Company's Service, as to the efficacy of the Patent process in the preservation of the *Melbourne's* sails and canvas, will be found in page 25.

See also Testimonial from J. Nolloth, Esq., late Master-Shipwright of Portsmouth Dockyard, as to the preservation of Timber, Canvas, &c., in Part I., page 13.

SIR:

Junior U. S. Club, Aug. 2nd, 1842.

I regret that indisposition has been the cause of my not having replied to your note of the 20th July, ere this.

And in answer to your inquiries respecting the sails of Her Majesty's steam-vessel *Devastation*, that had been prepared with your Solution, I regret to inform you that only ONE SAIL was so fortunate as to be submitted to your preparation, but which was sufficient to prove, beyond doubt, the merits of YOUR VALUABLE invention, as it was the only sail, after a trial of three months of incessant wet weather, that had not the slightest appearance of mildew; whereas ALL the others, notwithstanding every means were taken to prevent it, became more or less mildewed, and I feel perfectly convinced, had they been prepared with your Solution, nothing of the kind would have taken place; and I am satisfied, from its incomparable merits, that the day is not far distant, when not a sail, or bolt of canvas will be permitted to be supplied to Her Majesty's ships, without having been prepared with your VALUABLE discovery.

I have the honour to be, your obedient servant,

To SIR WM. BURNETT, K.C.H.,

G. J. GORDON,

&c. &c. &c.

*Late Commander of H.M.S. Vessel 'Devastation.'*

FURTHER TESTIMONIAL.

DEAR SIR WILLIAM:

H. M. S. V. 'Cormorant,' Callao, 7th Sept. 1845.

I am much surprised at hearing from Mr. Holdsworth, that you have not received the letter that I wrote you last April twelvemonth from Tahiti, giving an account of an experiment we tried with an awning that had been prepared by your (I think) *invaluable Patent*: and I have much pleasure in congratulating you on its complete success, as the accompanying document will testify. The suit of sails that we now have bent are very much stained, and mildewed; and, in fact, are useless—with the exception of the studding sails, which have undergone your preparation, and are, at this moment, as free from stains and mildew as when first taken in use, which is now more than two years: of course they have not been as much exposed as the other

sails, being usually unbent in harbour; but I can assure you they have been *well tried*; as I *invariably* set sail when there is the slightest prospect of its being useful; and I have become, if possible, a greater advocate for all sails being prepared with your Solution, than I was when in command of the *Devastation*, when I first became acquainted with its value.

I hope you caution the persons who superintend the preparation of the canvas to be *very particular* with it, as I am convinced should it ever fail, it is from their negligence, and *not* from any imperfection in the Solution; so that your credit is entirely in their hands.

I must now conclude, with every wish for the success for your Patent.

Believe me, very truly yours,  
(Signed) G. J. GORDON,  
Commander, R.N.

The rain awning supplied to Her Majesty's steam-vessel *Cormorant*, having undergone Sir William Burnett's preservation Patent, was kept spread for five successive days in rainy weather, when it became thoroughly saturated with water. It was then rolled up and exposed to a tropical sun and rains, for the purpose of testing the preparation, and on opening it, after remaining in this state for ten days, it was found to be entirely free from mildew or stains.

The quarter-deck awning, which had not been prepared, was on the contrary much mildewed after being exposed in a similar manner, only a few hours.

From this trial, as also from other circumstances which have come under our observation, we are of opinion that Sir William Burnett's Patent, for the preservation of canvas, is invaluable.

Given under our hands, on board H. M. steam-vessel *Cormorant*, at Callao, this 1st of September, 1845.

G. J. GORDON, Commander.  
(Signed) R. HILL WHARTON, Senior Lieut.  
J. W. WARREN, Master.

DEAR SIR: 8, Lockyer-terrace, Plymouth, 6th November, 1845.

During three years' experience on the Coast of Africa, I have seen your prepared canvas tried in every form and shape, with the greatest success: in fact, I never saw a spot of mildew on prepared canvas (either in awnings or sails), when I have frequently seen unprepared canvas completely covered with mildew in six or eight hours.

I have the honour to be, Sir, your obedient servant,

(Signed) JOHN SECCOMBE, Lieut., R.N.,

Late of H.M. Ship '*Espoir*,' serving on the Coast of Africa.

To Sir William Burnett, K. C. H., &c. &c.

MY DEAR SIR: 110, Fenchurch-street, 19th December, 1842.

The accompanying letter from the master of a ship belonging to the West African Company affords satisfactory proof of the utility of Sir William Burnett's preparation; to test which, I had some of the *Golden Spring's* new sails steeped, and others sent on board at the same time, without any preparation. Mr. Irving's letter reports the result.

Yours, faithfully,

JOSEPH WOODHEAD, Esq.

JAMESON HUNTER.

West African Company, Levant-house, St. Helen's-place,  
London, 17th December, 1842.

I beg to make the following report of the sails steeped in Sir W. Burnett's preparation in 1839. The top-gallant-sail that has been in constant use during two voyages, and subject to the vicissitudes of an African climate, is about two-thirds worn; while a fore-top-gallant-sail in use during the same period, and not steeped, has been obliged to undergo a thorough repair. The top-mast studding-sail which was steeped and was stowed away the greater part of the same time, has been quite free from mould, and is in sound condition. The steeping process of Sir W. Burnett has therefore my sincere recommendation.

I am, Sir, your obedient servant,

JAMESON HUNTER, Esq.,  
110, Fenchurch-street.

HENRY IRVING,  
Master of the Barque '*Golden Spring*.'



DEAR SIR :

*Ship 'Forester,' W. I. Docks, 26th December, 1842.*

Before leaving again for the West Indies, I beg to state that the canvas you prepared for this ship was made into a quarter-deck awning, and spread day and night for four months while lying at Tobago. I have much pleasure in saying that it is now perfectly free from spot or mildew.

Likewise the canvas we had 'Burnettized' from you in 1840, and by mistake made use of in repairing our droger's main-sail, and part of a new fore-sail, is now equally free. Those who are acquainted with the wear and tear of canvas on board of a droger in the West Indies, or of an awning in a tropical climate, will appreciate your Solution.

I remain, dear Sir, yours truly,

To the Secretary of  
SIR WILLIAM BURNETT'S Patent.

D. M'ARTHUR.  
Captain of ship 'Forester.'

MY DEAR SIR :

*St. John's-wood, Regent's-park, 31st December, 1842.*

I have to apologise for not sooner communicating to you in writing what formed the subject of our conversation when I had the pleasure of seeing you, but I was unexpectedly called out of town.

When at Valparaiso last July, I made minute inquiry on board the *Dublin* as to the effect of your Solution on the sails of that ship, having learnt by my own experience how rapidly mildew appears on canvas in ships employed on the Western side of South America, whatever care and precaution may be adopted to avert the evil.

I saw and examined the awnings of the *Dublin* which had been in constant use for several months at Lima, where from the very heavy dews they were almost every twenty-four hours wet and dry, and I was informed that they had often been furled perfectly wet, and not spread again for days, on purpose to try them; but there was not one single spot of mildew to be seen on them. The studding-sails much used and frequently taken in and made up wet,—days passing without opportunity of spreading them out to dry,—when opened were neither warm or stained with mildew, whereas other studding-sails not dipped were found in the *Dublin*, as in every other ship on that Station, absolutely black in one night.

It was the opinion of the officers serving on board the *Dublin* that the sails prepared by your Patent were decidedly more durable than those made with the unprepared canvas.

Wishing success to an undertaking so calculated to give superior efficiency to our shipping, and to cause a great saving to Government,

I am, my dear Sir, very truly yours,

SIR W. BURNETT, K.C.H., &amp;c. &amp;c. &amp;c.

JENKIN JONES,  
Capt. R.N.

SIR :

*North Bank, Regent's-park, January 25th, 1843.*

I prepared two pieces of sail-cloth according to your direction, and, on the 25th of April last, placed them in a damp cellar with two pieces of the same cloth unprepared. I have this day examined them, and find that the prepared cloth is in a state of perfect preservation, while the unprepared is covered with mildew, and is rapidly decaying, insomuch that it may be torn to pieces with a very slight effort.

I consider this experiment a very decisive practical proof of the value of your invention as a preventive of dry rot.

I am, Sir, your very obedient servant,

SIR WILLIAM BURNETT, &amp;c. &amp;c. &amp;c.

(Signed) JOHN HEMMING.

SIR :

*March 1, 1843.*

In reply to your request to be informed as to the efficacy of Sir W. Burnett's Patent on the canvas which I had steeped in the Solution for my ship, the *Duke of Roxburgh*, I beg to state that the preparation had a decided effect in preserving it from mildew.

The only sails I tried were awnings and studding-sails, which were always kept rolled up on deck, without any protection from the wet, and they were exposed to all kinds of weather. I have, therefore, every reason to appreciate the process of Sir W. Burnett.

I remain, Sir, your obedient servant,

(Signed)

G. P. COLLARD,

To the Secretary, Sir W. Burnett's Patent.

Captain and Owner.

SIR:

*Barque 'Hamlet,' London, 23rd July, 1843.*

The sails which I had dipped in your Solution have answered the purpose for which it was intended, and I intend to make further use of the process.

I am, &amp;c.,

To the Secretary, Sir W. Burnett's Patent.

(Signed) J. WILSON,  
Commander.

SIR:

*'Duke of Cornwall' steam-ship, London, 17th Oct., 1843.*

Yours of the 28th September reached me in Dublin. In reply, I beg to say the awning prepared for us a twelvemonth since does not appear to have the least mildew on it, although repeatedly rolled up wet during the summer. I now send you a jib for the same process.

I am, Sir, yours, most obediently,

To the Secretary, Sir W. Burnett's Patent.

HENRY H. MILLS, *Captain**'Trent,' Nov. 10, 1843 (Southampton).*

I have much pleasure in bearing testimony to the state of the sails on board the Royal Mail Steam Packet Company's Ship *Trent*, under my command—one suit of which has been almost constantly bent for nearly two years, and, during that time, exposed to the sudden vicissitudes of heat, wet, and cold, peculiar to our voyages; also, that the spare suit have been on board the ship the same period of time, and occasionally bent, when those generally used required repair; and that, in neither case is there one spot of mildew—having carefully examined every sail a few days previous to our arrival in port.

I am, your most obedient servant,

To the Secretary of Sir W. Burnett's Patent.

F. S. BOXER, *Captain.*

SIR:

*Royal Mail Steam-Packet Company's Offices,  
Southampton, 8th January, 1844.*

I beg to acquaint you that I have examined the condition of the sails originally supplied to the Royal Mail Steam-Packet Company's ships *Thames*, *Trent*, and *Medway*, said to have been 'Burnettized,' and found the canvas in a state of good preservation, free from mildew; but as there are none of the stamps remaining, I have no means of ascertaining the fact if these sails actually underwent the process referred to.

I am, Sir,

To CHARLES JACKSON, Esq.,

Your obedient servant,

Secretary, &amp;c. &amp;c.

RICHARD BARTON, *Superintendent.*

## TESTIMONIAL FROM THE LATE E. N. KENDALL, ESQ., R.N.,

*Formerly Superintendent of the ROYAL MAIL STEAM-PACKET COMPANY'S vessels,  
under whose inspection the Sails abovementioned were prepared with SIR WM.  
BURNETT'S PATENT.*

*Peninsular and Oriental Steam Navigation Company's Offices,  
57, High-street, Southampton, 4th March, 1844.*

MY DEAR SIR:

I regret to say that the *Oriental* sailed on the 1st instant, the date of your note. I was unable to obtain from Captain Soy that which I know he would have been ready enough to grant, namely, a further testimonial as to the efficacy of Sir Wm. Burnett's preparation in destroying or rather neutralising the offensive effluvia from bilgewater; but I can myself afford the most ample testimony to the fact, not only in the *Oriental*, but in other vessels in the Company's employ, where the experiment has been made with the happiest results; so that I have no hesitation whatever in recommending its application, not only for the purpose of purification, but because of its preservative properties, of which I am more and more convinced by experience. It is now nearly three years and a half since I recommended to the Directors of the Royal Mail Company the propriety of having the canvas of ALL their ships subjected to this process; but from some unexplained cause I was not successful in carrying out my views to their fullest extent. Some of the sails were, however, made of 'Burnettized' canvas, and to the best of my recollection they were the following, viz.:

Medina,  
Thames,  
Medway,Trent,  
Isis.

} in all about 760 bolts.



Since I have held the appointment of Superintendent to the Peninsular and Oriental Steam Navigation Company (three years), with twelve ships under my charge, I have had abundant opportunity for testing the value of the opinion which I had previously entertained as to the utility of Sir W. Burnett's invention, and feel pleasure in recording that my favourable impressions have in every instance been most satisfactorily confirmed. With my own will I would never use a yard of canvas that had not undergone the process.

CHARLES JACKSON, Esq., R.N.

I am, my dear Sir, yours truly,

E. N. KENDALL.

DEAR SIR:

*Peninsular and Oriental Steam Navigation Company's  
Offices, Southampton, 27th May, 1844.*

I hereby certify that the sails of the Royal Mail Steam-Packet Company's ships *Thames* and *Trent* were subjected to Sir William Burnett's process before being made up. I also inclose the certificate of Captain M'Leod, of the *Great Liverpool*, which you will find entirely to bear out the opinion which I have so often expressed as to the efficacy of the preparation.

C. JACKSON, Esq.,  
Secretary to Sir W. Burnett's Patent.

Yours, truly,

E. N. KENDALL.

SIR:

*'Great Liverpool' steam-ship, Southampton, 27th May, 1844.*

In compliance with your order to report on the sails of this ship which were made of 'Burnettized' canvas, I have to inform you that great part of the said sails have been in constant use for nearly three years, and that they have been frequently furled for fifteen and twenty days together, in head winds, and when at anchor; that not the slightest appearance of mildew has been observed while bent or in the sail-room, and that the canvas is in every other respect equal to that used for sails.

To Lieut. KENDALL, R.N.,  
Superintendent, Peninsular and  
Oriental Steam Navigation Company,  
Southampton.

I am, Sir,

Your obedient servant,

A. M'LEOD,  
Commander.

DEAR SIR WILLIAM BURNETT: *Lymington, Hants, 15th January, 1845.*

I cannot help mentioning to you the very successful result of the trial of your valuable Solution in the case of the only article left on board the *Frolic* that had been immersed, namely the rain-awning. It is needless for me to repeat to you the torrents of rain and severe gales which occasionally occur on the Brazilian coast and in the river Plate, which would severely test any canvas: I have but to add, that notwithstanding its frequent (and latterly almost constant) use, the awning appeared to me, when I left the *Frolic*, as good as it was when I drew it from Portsmouth Dock-yard, two years before!

I beg to congratulate you on this additional test to so many others which have ended as happily, and that you will believe me

Very faithfully yours,

(Signed) J. H. WILLES,  
late Captain of H.M.S. 'Frolic.'

*Extract from a Note, dated the 29th March, 1845, from A. H. HOLDSWORTH, Esq.,  
to SIR WILLIAM BURNETT.*

I wrote a few lines before I left London; I have now the pleasure of mentioning that I have just heard from Gordon, of the *Cormorant*, in which letter the following passage occurs:

Pray make my compliments to Sir William Burnett, if you see him, and say nothing can have behaved better than his canvas. Our quarter-deck awning, that had not been prepared by him, in *one night* became full of black spots, and in fact became completely mildewed. I then ordered one that had been prepared by his process to be brought on deck, to be wetted, and then rolled up and kept in that state for *ten days*, exposed to a hot sun and heavy showers near the funnel; and at the expiration of that time it was dried, and found to be as good as when it came from the sail-loft.

This is as satisfactory an account as you could wish to receive, but you have so many proofs, that it is perhaps of little value. I have however only obeyed his wish, in troubling you with it.

SIR: 3, Great Queen-street, Westminster, 12th June, 1844.

Since my arrival in England I have been desired, for the information of my Lords Commissioners of the Admiralty, to make a Report upon the awnings dipped in Sir William Burnett's Solution, which were sent out to Rio de Janeiro for the use of H.M. Receiving Ship *Crescent*, then under my command.

They had been in constant use for about twelve months, were not in the least affected by mildew, or rotted by alternate hot sun, and rain, as former awnings were.

My opinion is, they will last as long again.

I have further to add, that several of H.M. Ships on the station made a practice of sending some of their sails on board of the *Crescent* to be taken care of until going to sea. I remarked those dipped in the solution were perfectly free from mildew, whilst the others were much affected.

I have the honour to be, Sir,

Your most obedient and humble servant,

(Signed)

M. DONELLAN.

Lieutenant late commanding H.M.S. '*Crescent*.'

To the Honourable SIDNEY HERBERT, M.P., Admiralty.

Extract of a Letter from Lieutenant WALTER LESLIE, commanding Her Majesty's Brig '*Penguin*,' dated 29th November, 1843.

On sailing for the Brazils last January, awnings for the *Crescent* were put on board, prepared according to Sir W. Burnett's Patent. We shipped much water, and much found its way below. Continual moisture dropped from the deck and beams. To my surprise they (the awnings) came up smelling sweet and fresh, while the other sails were damp and mouldy.

In my humble opinion, the canvas prepared in this manner is peculiarly adapted to small vessels, they having no place of shelter for many sails they are obliged to keep continually; namely, royals, studding-sails, and awnings; and I feel confident we have expended more of these sails from mildew, than from actual wear; especially as we are so much in warm climates.

From Messrs. T. and J. M'Cartney, grain merchants, &c., Lesmahagow, Lanarkshire.

GENTLEMEN:

Lesmahagow, 19th August, 1844.

In reply to your inquiry respecting the 'Burnettized' sacks, our experience for twelve months enables us to say, that the Patent process they are made to undergo is a certain preventive against the usual, and always fatal effects of damp; some of ours having stood with meal in them for half a year at a time, without sustaining any injury.

To Messrs. Wm. Middleton and Son,  
Sole Agents for Sir William Burnett's Patent,  
68, Glassford-street, Glasgow.

We remain, yours, respectfully,

T. & J. M'CARTNEY.

Extracts from two Letters from Messrs. Gunter, Greenaway, and Co., dated Calcutta, 3rd January, 1845.

DEAR SIR,

As regards the canvas damaged on board the *Seringapatam*, and sold on account of the underwriters, although soaked through, discoloured, and by the exterior appearance rendered unsaleable and unmerchantable, having been immersed in the hold of the ship for several days, two bolts which we purchased for the purpose, after having been unrolled, laid out in the sun, and rubbed with a cloth, is in no way different from that portion of the invoice which had not been subjected to wet and heat of the hold. These two bolts we have kept in the office, and submitted to many parties as a proof of the superiority of the 'Burnettized' canvas.

We remain, dear Sir, yours faithfully,

(Signed)

GUNTER, GREENAWAY, & Co.

CHARLES JACKSON, Esq.

DEAR SIR:

Calcutta, 2nd December, 1845.

There can, however, we should think, be no doubt of the canvas answering when prepared with the Patent, after the test of it in the accident to the *Seringapatam*, where, after floating about in the hold of the ship for several days, it was landed, exposed to the sun, and appeared free from mildew, as explained in our former letter, dated 3rd January, 1845.

We remain, dear Sir, yours faithfully,

(Signed)

GUNTER, GREENAWAY, & Co.

CHARLES JACKSON, Esq.



24 *Testimonials as to Prepared Canvas, Woollen, &c.**Extract of a Letter, dated Bombay, 31st October, 1845.*

DEAR SIR:

The Commander of my Ship *Buckinghamshire*, just returned from a voyage to China, speaks so highly of the batch of canvas you sent to me, both as regards the quality of the 'canvas, and the benefits derived from 'Burnettizing' it, that I beg you will send me by an early opportunity on my account (100) one hundred bolts of the same quality as before.

I wish the canvas to be of exactly the same quality, the only difference from the last consignment being in having a few more of the heavy Nos., on account of the large size of my ships.

I hope I shall be able to persuade some of the ship-owners here to patronize the 'Burnettized' canvas to a great extent, as soon as its real value becomes better known.

Dear Sir, yours sincerely,

(Signed)

FRAMJEE COWASJEE.

To Charles Jackson, Esq., Secretary to Sir William Burnett's Patent.

DEAR SIR:

*Ship 'Buckinghamshire,' London, 2nd Dec., 1846.*

Having tried your 'Burnettized' canvas on board this ship for the last three years, I am anxious to add my testimony of its superiority over canvas in an unprepared state. Since I have used your prepared canvas, my sails and awnings have been entirely protected from mildew and rot. The sails were sewn with unprepared twine: after they had been exposed to much wet, the twine became rotten, leaving the canvas perfectly free from any tendency to decay.

I am, dear Sir, your most obedient servant,

C. Jackson, Esq.,  
Secretary, &c. &c.

(Signed)

D. MACGREGOR,  
Commanding the ship 'Buckinghamshire.'

SIR:

*Cromer, 23rd February, 1846.*

I have occasionally used your preparation for sails, and, from what I have seen of the wear of the sails so prepared, I am so fully persuaded of its efficacy that, being about to launch a new vessel, I have determined to prepare her whole suit of sails before bending them.

I will therefore thank you to forward me, as early as possible, by rail, (or van, if any,) to Norwich, a jar of the Chloride, that which is usually used for canvas.

I have not given your preparation for timber sufficient trial in SEA-WATER to say much about it, as the worm is our greatest enemy; but as soon as I can discover anything decisive, I will forward you particulars, when at the same time I may say something about fishing, having had mackerel-nets with one preparation, working three seasons, against nets tanned every season. Interim,

I remain, yours obediently,

To C. JACKSON, Esq., &amp;c.

(Signed)

HENRY SANDFORD.  
Secretary to Sir William Burnett's Patent.

SIR:

*Lincoln, 2nd May, 1846.*

In consequence of the increase of our trade in railway covers, which we ascribe to the use of Sir William Burnett's Patent Solution, we are under the necessity of erecting much more extensive premises. Having some very fine black poplar trees in the field where we are erecting our manufactory, we are desirous of using them for floor-boards and joists. If you will allow us to 'Burnettize' them, we can borrow a tank of a neighbour. Waiting your reply,

We are, Sir, your obedient servants,

(Signed)

To the Secretary of Sir W. Burnett's Patent.

B SINGLETON &amp; SON.

*Extract from an Official Report, dated Portsmouth Dockyard, 24th September, 1847.*

SIR:

In obedience to your memorandum of the 23rd instant, respecting the canvas that was rolled upon rollers, and has been deposited in the cellars of the Hemp-house since April, 1839, we beg to report that we have carefully surveyed the said canvas, and find that one of the pieces was prepared with Sir William Burnett's Solution, and the

other unprepared. The latter is very much mildewed in every part, and in several places so rotten that it broke through on being removed from the roller, which was very much decayed; whereas the canvas prepared with Sir William Burnett's Solution is perfectly free from mildew, excepting a few small spots, which appear to have been caused by its being in contact with some particular fluid; and the sound state of the roller on which the prepared canvas was rolled, compared with the other, is very remarkable, it having been cut from the same spar.

We remain, Sir, your most obedient servants,

(Signed) CHARLES BROWN, *Master Attendant.*  
J. TAPLIN, *Master Sailmaker.*  
B. HARVEY, *Master Rigger.*

To the Admiral Superintendent, &c. &c. &c.

**Preservation of Vaucher's Patent Canvas Hose.**

DEAR SIR:

1, *Three Kings-court, Lombard-street, 27th May, 1845.*

From the observations I have made, and the reports I have had from parties using the woven hose without seam (of which I have the patent), I am enabled to bear testimony to the advantageous effects of Sir W. Burnett's Patent preparation upon it.

I have from my own experience found, that in leaving small pieces of the hose in a damp cellar, the one prepared and the other unprepared, that the former retains its primitive strength, and suffered no ill effects from dry rot or mildew; the unprepared, on the contrary, after a time, becomes mildewed, and almost in a decayed state. From the reasons above-mentioned, I embrace every opportunity to recommend parties applying to me for hose, to allow me to furnish it to them prepared. I have great pleasure in stating these particulars, which I offer as the best proof of the high estimation I entertain of the effects of the preparation.

I remain, dear Sir, your obedient servant,

To C. Jackson, Esq.

(Signed) A. L. BENSUSAN.

SIR:

*Manchester, July 23rd, 1845.*

In answer to yours of the 16th instant, I beg to state that, in my opinion, the preparation of Sir W. Burnett is of the greatest benefit to your hose. I have tried in my establishment both the prepared and the unprepared, and I find the prepared hose much more durable.

I am, Sir, your obedient servant,

To A. L. Bensusan, Esq.,

(Signed) WILLIAM ROSE.

Patentee of the Woven Hose without seam.

**FURTHER TESTIMONIAL.**

DEAR SIR:

1, *Chapel-place, Poultry, 11th February, 1850.*

In reply to your inquiries respecting the effect of Sir William Burnett's process as a protection against the effect of mildew. I can speak very confidently of its great advantage on "Vaucher's patent hose," of which I have held the patent since 1844; and since that period I have invariably recommended its adoption, and never had one single complaint.

My agent in the north who takes the hose from me in very large quantities, I am sure would be ready to bear the same testimony.

I have been in the habit of sending my hose both to the East and West Indies, and have found the preparation an incalculable benefit.

In assuring you of the pleasure I have in thus giving you my unequivocal opinion on the matter,

I remain, Sir, your obedient servant,

C. JACKSON, Esq.,

(Signed) A. L. BENSUSAN.

Sir W. Burnett's.



## Prepared Cordage, Garden Nets, &amp;c.

Vide Testimonial from Mr. Richard Greening, as to prepared line, in page 10.

SIR:

*Admiralty, 8th January, 1842.*

"I am commanded by my Lords Commissioners of the Admiralty to send you herewith a copy of a report from the officers of Portsmouth Yard, of trials of strength of cordage and canvas prepared with a solution of chloride on your plan.

I am, Sir, your most humble servant,

To SIR WILLIAM BURNETT.

J. BARROW.

SIR:

*Portsmouth Yard, June 24th, 1840.*

Having made the undermentioned trials of strength of cordage and canvas prepared with a solution of chloride on the plan of Sir William Burnett, also of corresponding sorts unprepared, agreeably to your directions, I beg to report the result, as follows, as ordered by your memo. of the 22nd instant:

| Cordage 2½ inches, 25 thread      |   | Tons cwt. qrs. lbs |   |                                         |
|-----------------------------------|---|--------------------|---|-----------------------------------------|
| Italian white, prepared . . . . . | 2 | 10                 | 3 | 7½ { Hung up and exposed to wet and dry |
| Ditto unprepared . . . . .        | 2 | 9                  | 3 | 26½ { in Dr. Henderson's garden.        |
| Unprepared broke in the splice.   |   |                    |   |                                         |
| Ditto prepared . . . . .          | 2 | 7                  | 3 | 7½ { Hung up at the sheers, exposed to  |
| Ditto unprepared . . . . .        | 1 | 19                 | 3 | 7½ { wet and dry.                       |
| Unprepared broke in the splice.   |   |                    |   |                                         |
| Ditto prepared . . . . .          | 1 | 9                  | 2 | 7½ { Buried in the mud, in the South    |
| Ditto unprepared . . . . .        | 1 | 8                  | 3 | 7½ { Camber.                            |
| Unprepared broke in the middle.   |   |                    |   |                                         |
| Ditto prepared . . . . .          | 1 | 9                  | 3 | 7½ { Under water at the South dock-     |
| Ditto unprepared . . . . .        | 1 | 12                 | 0 | 7½ { gate.                              |
| Unprepared broke in the splice.   |   |                    |   |                                         |
| Ditto prepared . . . . .          | 0 | 14                 | 2 | 0 { Hung under the arch at the end of   |
| Ditto unprepared . . . . .        | 0 | 8                  | 0 | 0 { the South Camber, under water,      |
|                                   |   |                    |   | { and out of it, as the tide ebbd       |
|                                   |   |                    |   | { and flowed.                           |

See Testimonial signed H. E. Amedroz, for the Secretary of the Admiralty, dated July 13, 1840, as to prepared Cordage and Canvas; in page 10.

See also Testimonials, from Captain Tune, and J. Robinson, Esq., dated 19th March, 1842, respecting Lead-lines, &c.; in page 18.

SIR:

*Jerusalem Coffee-house, London, 12th May, 1842.*

I have to acknowledge the receipt of your letter of yesterday's date, requesting me to give my opinion of Sir William Burnett's Solution for the preservation of rope, canvas, planks, &c.; a large quantity of each of these articles having been supplied in a prepared state to the late East India Ship *Viscount Melbourne*, lost in January last, in the China Sea.

It is with pleasure I give my testimony to the value of Sir William Burnett's Solution, having had ample opportunity to judge of its good effects, during a period of fifteen months, viz.: from October 1840 to January 1842, when my unfortunate ship was lost. I will briefly give my reason for judging thus favourably of it, viz.:

1. ROPE. The *Melbourne's* rope was supplied and made by the same person, of the same description of yarn; one-half was tarred in the usual manner; the other half was dipped in Sir W. Burnett's Solution. To give both kinds a fair trial, braces, buntlines, clue garnets, &c., were rove in opposition to each other. After several months had elapsed, the prepared was found to wear better than the tarred rope, and to have the additional advantage of being much lighter, easier to work, and causing less 'chafing' to the sails. It is decidedly to be preferred for 'running gear.'

2. CANVAS. All the *Melbourne's* new sails and store canvas had been dipped in the solution, which made them softer, consequently *lighter to work*, than they would otherwise have been. There was not the least appearance of *mildew* during the voyage.
3. PLANKS. The launch was lined with planks prepared in the solution already mentioned; with the exception of one month, when her services were required for the ship, about thirty sheep were constantly kept in her, without the slightest detriment to the wood. This boat was the providential means of saving the lives of twenty-seven people, who were exposed in her to the elements for thirteen days, during which time they traversed 1000 miles. I consider that the excellent *sound state* in which she was, is to be attributed to her *planks for lining* having been prepared in Sir W. Burnett's Solution; and having had good cause to know its value, would strongly recommend it to the notice of all persons connected with shipping.

I have the honour to be, Sir,  
Your most obedient, humble servant,

CHARLES W. M. S. M'KERLIE, late H.C.S.

To the Secretary for Sir W. Burnett's Patent. *Commander late East India Ship  
Viscount Melbourne.*

SIR: *Formosa, Berks, March 7, 1843.*

I am sorry to say I have lost the dates of the experiments I made with Sir W. Burnett's preparation, or I should have written to you ere this. The first net was exposed for about six months on my lawn, *in a heap*, and when it did not rain, I had water thrown over it, *on purpose to give it as severe a trial as possible*. When taken up, I found the net in as good condition as when first prepared.

An unprepared net would have been rendered unfit for use by *such treatment* in less than a fortnight. The second net has been in constant use since February 1842, and I cannot perceive any sign of decay in it.

I am, &c. &c.,

To the Secretary, Sir W. Burnett's Patent. (Signed) I. G. BERGMAN.

#### FURTHER TESTIMONIAL,

*In correction of the above-mentioned DATES.*

SIR: *Formosa, Berks, 8th March, 1843.*

You are quite correct respecting the second net; it was prepared in *March 1841*, and not in February 1842, as I stated, and has been used a great deal.

I consider the preparation equally applicable to canvas, and intend to use it much more generally than I have done, as I am convinced I shall save considerably by doing so.

Your obedient servant,

To the Secretary, Sir W. Burnett's Patent. (Signed) I. G. BERGMAN.

GENTLEMEN: *14, Macfarlane-street, Glasgow, 12th February, 1844.*

At your request we have much pleasure in certifying that, so far as our experience goes, your process of 'Burnettizing' ropes has been very successful, rendering them much more pliable, and not nearly so liable to decay, wet having no injurious effect on them; the same quantity of ropes now serving us, on an average, fully double the time they formerly did when unprepared.

We are, Gentlemen, your obedient servants,

(Signed) THOMAS FRAME & Co., wood merchants.

To Messrs. W. MIDDLETON and SON,  
68, Glassford-street, Glasgow, Agents for Sir W. Burnett's Patent.

GENTLEMEN: *Glasgow, 14th February, 1844.*

At your request I now send you my experience on tarred and untarred rope-yarn, spun from the same material. I find that the tarring deteriorated from its strength about one-third, and added to its weight about one-fifth, and doubled the stiffness of the rope.

I am, Gentlemen, yours truly,

(Signed) JAMES LANG,  
*Inventor and Patentee of machinery  
for Spinning Rope-yarn.*

To Messrs. MIDDLETON and SON,  
sole Agents for Sir W. Burnett's Patent.



## Protection of Woollen from Moths, &amp;c.

*North America and West India Station,  
H. M. Sloop "Pantaloön," Halifax, Nova Scotia, 1st July, 1847.*

Report of the undermentioned articles, under trial on board this sloop.

One bale of blue worsted woven jackets, prepared with Sir Wm. Burnett's solution, for the purpose of preserving them from moth or damp.

When opened in June 1847, after having been twelve months in the ship, stowed in the after slop-room, were found to have been kept perfectly free from the attack of moth or other vermin, and do not appear to have suffered in the least from damp; but, on the contrary, were in as perfect a state as the day they were packed.

(Signed) H. J. DOUGLAS, Commander.

SIR :

*Her Majesty's Sloop "Kingfisher," 18th January, 1847.*

The bale of slop-clothing, specified below, having been received on board Her Majesty's sloop under my command, on the 19th of January 1846, for the purpose of being kept for a period of twelve months, unopened :

I have the honour to report, for the information of my Lords Commissioners of the Admiralty, its state and apparent qualities when issued to the crew, agreeably to the instructions furnished to Commander C. H. Brown, from the Victualling Establishment at Ascension, on their making the supply,—

That the stores in question had continued quite free from the attack of moth, or any other vermin, exhibiting no signs whatever of decay, its appearance indicating strength and durability.

I have the honour to be, Sir, your most obedient servant,

(Signed) FREDERICK WILMOT HORTON,  
Commander.

[Blue serge in the piece, and materials, one bale containing eighty yards; prepared with Sir Wm. Burnett's solution.]

SIR :

*Her Majesty's Sloop "Waterwitch,"*

*Cape Lopez Bay, 21st April, 1847.*

When at Ascension, in January 1846, I received on board this sloop a bale of serge frocks, Burnettized, together with a copy of a letter from the Comptroller of the Victualling, desiring that it may be kept on board twelve months, before being opened.

I have to acquaint you, I this day caused the bale to be opened, and I find the frocks are in a high state of preservation, not having suffered in the least degree from moth or damp.

To the Secretary of the Admiralty.

I have the honour to be, &c.,

(Signed) T. F. BIRCH, Commander.

SIR :

*Admiralty, 27th May, 1839.*

I beg to acquaint you, that on the 4th December, 1838, I placed several pieces of your prepared cloth and fur in a tin chest, containing some clothing much infested with the moth: upon examination, it appears that the cloths and fur, so prepared, are now in the same state as when first placed in the chest, *untouched by the moths*; indeed the insects appear to me to be *totally destroyed*, for nothing but the cases or skins remain in the chest, which I conceive can only be attributed to the effects of your preparation.

I have the honour to be, Sir, your most obedient, humble servant,  
To Sir W. Burnett, K.C.H., &c. &c.

(Signed) THOS. MORTON.

SIR :

## FURTHER TESTIMONIAL.

*Admiralty, 1st July, 1841.*

With reference to my Report to you of the 27th May, 1839, I have again examined the marine clothing (chiefly great-coats, articles the moths make great havoc with, and which were much affected with them,) contained in a tin chest in my custody, and amongst which clothing several pieces of your prepared cloths and fur were placed, on the 4th December, 1838. I now find the cloths and fur so deposited remain untouched by moths, and they appear to me to be in the same state as when first deposited in the chest; and I have no hesitation in stating, that your prepared cloths have been the means of destroying the moths that were in the chest, previous to the introduction of your prepared cloths and fur.

I have the honour to be, Sir, your most obedient, humble servant,  
To Sir W. Burnett, K.C.H., &c. &c.

(Signed) THOS. MORTON.

# REPORTS

ON THE

SOLUTION OF CHLORIDE OF ZINC,

AS EMPLOYED FOR THE

PURIFICATION OF SHIPS' HOLDS;

FOR THE

DESTRUCTION OF UNWHOLESOME AND OFFENSIVE EFFLUVIA;

AND FOR THE TREATMENT OF

ERYSIPELATOUS, ULCERATIVE,

AND OTHER DISEASES.

---

LONDON:

PRINTED BY W. CLOWES & SONS, 14, CHARING CROSS.

1851.



REPORTS

OF THE

COMMISSIONERS OF THE LAND OFFICE

IN RESPONSE TO A RESOLUTION OF THE HOUSE OF COMMONS

PASSED IN 1848

LONDON: PRINTED BY W. CLAY, ST. MARTIN'S LANE, 1849.

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# INFLUENCE OF THE SOLUTION ON BILGE-WATER AND THE EFFLUVIA OF FOUL HOLDS.

THE Right Honorable the Lords Commissioners of the Admiralty having directed Sir William Burnett to make known throughout the naval service, and to the public generally, the influence which the solution of the chloride of zinc has on bilge-water, and on certain deleterious gases evolved during the decomposition of animal or vegetable substances, the following documents, from a vast number of a similar nature, have been selected for publication; and it is believed they will most satisfactorily prove that as a deodorant, it possesses properties far superior to any other which has yet been discovered; and that when properly and freely used, it cannot fail to improve the sanitary condition of crowded vessels, and densely populated localities, in which the inhabitants may be compelled to breath offensive effluvia or unwholesome gases; and that, when used more sparingly for domestic purposes, it will add greatly to the comfort of all grades of society, whether in health or disease.

To prove that the solution has these peculiar properties, it will not be necessary to resort to mere vague assertion; its influence over known deleterious gases, and what may be called the morbid or offensive animal miasmata in general may be explained by the laws of chemical action; but if this cannot be done,—the conclusions arrived at with respect to its deodorant, and consequently disinfective properties, are at all events clearly admissible, from the constancy of the results obtained by experiments, often repeated and carefully conducted, under the observation of men, the conscientious wording of whose documents sufficiently attests that their only aim in these investigations was truth. Nothing has been stated on bare theory, and nothing admitted until the premises were undeniable. It is, moreover, a consideration of no minor importance to know that the fluid, when applied to the holds, or the decks of a ship, or to the bare floors and walls of human habitations, is perfectly harmless,—no evil consequences need be apprehended from its most abundant use,—a quality not possessed by several other substances and fluids employed for disinfecting or purifying purposes.

For the preservation of timber, canvas, and cordage, the solution of the chloride of zinc was first employed under patent in the year 1838, and it is now in general use for that purpose in the principal Royal dock-yards and arsenals, as well as in many extensive private establishments. It was not, however, until a later period that the discoverer, Sir William Burnett, was led to infer that if it acted as a preservative on these bodies when sound, it might also arrest decay already begun. This, by experiment, was found to be the case; and further, as a necessary consequence, that the evolution of effluvia was also instantly arrested. To put this latter property, however, fairly to the test, some



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offensive bilge-water was obtained, to which, in separate portions, small quantities of the solution, of various degrees of strength, were added, and in every instance with the most satisfactory result. The effluvium was instantly and completely annihilated. These results were at the time considered curious, but not of the importance and utility which experience has since proved them to be. It was, nevertheless, not long before an opportunity offered for trying the experiment on a large scale, and, as may be perceived by the following note from the Captain of the "Oriental," with the most perfect success:—

*Purification of Bilge Water, &c.*

"Oriental" Steam Ship, December 30, 1841.

SIR,

In reply to your note respecting the preparation of Sir W. Burnett for cleaning the vessel from bilge-water, I beg to say, we tried the mixture on the last voyage, and I am of opinion that we are much better now, as I never have perceived any effects of bilge-water on the passage home; whereas previously everything on board was discoloured, to the silver in our pockets and watches, which turned quite blue. I am not prepared to say that it arises solely from using the preparation, but will acquaint you on some future occasion, as I intend making further use of it.

I am, &c.,

(Signed) J. Soy, Commander of the "Oriental."

To Lieut. Kendall, R.N., Marine Superintendent,  
Peninsular and Oriental Steam Navigation Company, &c.

With respect to the employment of the solution on board ship, it will be necessary to inject it thoroughly into every crevice of the wood-work where there is any vegetable or animal matters in a state of decay, or where the wood appears at all damp or sodden from constant contact with bilge-water; and if the latter has accumulated so as to flood the limbers, it will be as well to pump it out previously to throwing down the dilute solution. Still, when this cannot be effected, or when the contents of the holds have become saturated and offensive, the smell may be completely removed by pouring down the solution at different places, so that it shall become intimately mixed with the bilge-water, or the articles lying in it. The following, however, is by far the most convenient, and the most effective mode of using it on board ship\*:—  
"The forcing-pump and fire-engine were used, and by their means the solution was forced into every part of the bottom of the ship which it was possible to reach; the nozzle of the pipe connected with the hose having been first directed into every opening between the beams in the wings communicating with the timbers, and afterwards led through the fore-cockpit, and pointed under the floor of the fore-magazine. Two hundred and twenty gallons of the diluted solution were thus disposed of, the remaining twenty having been poured round the step of the main-mast." The concentrated solution, when 40, 50, or even 60 times diluted with fresh or salt water, is of sufficient strength for purifying ships' holds, or the drains and gutters of houses.

\* See Letter from the Officers of H.M.S. "Hastings," page 16.

From the late E. N. Kendall, Esq., R.N., formerly Superintendent of the Royal Mail Steam-Packet Company's Vessels.

Peninsular and Oriental Steam Navigation Company's Offices,  
57, High-street, Southampton, March 4, 1844.

MY DEAR SIR,

I regret to say that the "Oriental" sailed on the 1st instant, the date of your note. I was unable to obtain from Captain Soy that which I know he would have been ready enough to grant, namely, a further testimonial as to the efficacy of Sir William Burnett's preparation for destroying, or rather neutralising, the offensive effluvia from bilge-water; but I can myself afford the most ample testimony to the fact, not only in the "Oriental" but in other vessels in the Company's employ, where the experiment has been made with the happiest results; so that I have no hesitation whatever in recommending its application, not only for the purpose of purification, but because of its preservative properties, of which I am more and more convinced by experience.

In 1844 it was further employed under peculiarly interesting circumstances. The Royal yacht, from the intolerable stench which issued from her holds, particularly when under weigh or in motion when at anchor, where the water was not perfectly smooth, had become almost uninhabitable, while every attempt to get rid of the nuisance had proved abortive. The introduction of the chloride, therefore, although spoken of by many at the time as chimerical, was recommended, and tried; with what success the following reports, made to Rear-Admiral Hyde Parker, will best show:—

Portsmouth Dock Yard, July 14, 1847.

SIR,

Agreeably to their Lordships' directions of the 9th instant, I have called upon the heads of the respective departments to report the effect of Sir William Burnett's fluid, when used for the removal of noxious smells, &c., and enclose their reports for their Lordships' information.

I am, &c.,

(Signed)

HYDE PARKER, *Admiral Superintendent.*

Henry George Ward, Esq.,  
&c. &c. &c.

Portsmouth Yard, July 14, 1847.

SIR,

With reference to your memorandum of the 12th instant, respecting the application of Sir William Burnett's solution as a disinfectant, we beg to report that the fluid was used in 1844 with that view on board the Royal yacht "Victoria and Albert," in consequence of the noxious effluvia from bilge-water, and the remedy was then and has since been found to be very effectual. The solution has also been successfully applied under similar complaints on board several ships in ordinary, and we therefore consider that its more general adoption in the navy would not only conduce to the comfort of the people, but might also tend to the preservation of the ships.

We are, &c.

(Signed)

JNO. FINCHAM, *Master Shipwright.*  
W. M. RICE, *Assistant ditto.*

To the Admiral Superintendent.

Her Majesty's Dock Yard at Portsmouth, July 14, 1847.

SIR,

In reply to your memorandum of the 12th instant, wherein I am directed to report the effect of Sir William Burnett's fluid when employed for the removal of noxious smells, such as bilge-water, or when employed as a disinfectant, if such has ever been the case; I beg leave to inform you, that I witnessed its application in February 1844, for the purpose of removing a more than ordinary stench of bilge-



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water and other offensive odours in the "Victoria and Albert" Royal yacht, with most complete success. I am informed by the carpenter that she has remained comparatively sweet ever since, and when a bilge-water smell is occasionally perceptible, a slight application of the fluid removes it.

I have heard from some of the officers that it has been used with remarkable benefit in several ships in ordinary for the same purpose.

I have ordered it for very disgusting privies, the effluvia from which it quickly neutralises.

I have employed the fluid in a severe case of open cancer, the fætor from which was intolerable to the patient and attendants; this it destroyed so long as the dressings were kept moist therewith.

I have witnessed the use of, and employed the fluid as a preservative of specimens of morbid anatomy, and found it just as good as spirits of wine.

I have tried various experiments on a small scale, on noxious gases and offensive odours, with, in every instance, perfect success, from which, and the efficacious results in the before-mentioned instances, there can be no doubt of the fluid possessing potent powers as a corrector of noxious and disagreeable odours; moreover, if sufficiently applied, and kept for a short space of time, so as to permit the timber to imbibe some of it, I am convinced that the fluid will not only correct the bilge-water smell, but have a resisting effect to its future formation.

(Signed)

Hyde Parker, Esq., C.B., Admiral Superintendent,  
&c. &c. &c.

I have, &amp;c.

JAMES HENDERSON, Surgeon.

Portsmouth Dock Yard, July 14, 1847.

Submitted for the information of their Lordships, agreeably to the direction of the 9th instant.

(Signed)

HYDE PARKER, Rear-Admiral.

Portsmouth Dock Yard, July 13, 1847.

Sir,

With reference to your memorandum of this day's date, directing me to report on the effect of Sir William Burnett's fluid, when employed for the removal of noxious smells, such as bilge-water, or when employed as a disinfectant;

I beg to state that when serving as master of Her Majesty's ship "Trafalgar," in 1845-6, it was frequently used for destroying the effects of bilge-water, and that it was highly approved of.

(Signed)

I am, &amp;c.

The Admiral Superintendent.

C. P. BELLAMY, Assistant Master Attendant.

The fluid having been subsequently tried in several other of Her Majesty's vessels, the following reports were obtained, and are here submitted in proof of its value as a means—when properly used—of effectually removing one of the greatest annoyances experienced on board ship, but more particularly in steam vessels, whether arising simply from bilge-water or from a foul state of the holds.

*From the Hon. Captain Plunkett to Sir Hugh Pigot.*

H.M. Steam Sloop "Stromboli," Clifden,  
January 21, 1845.

Sir,

In pursuance of an order from the Lords Commissioners of the Admiralty, I have to report upon Sir William Burnett's solution, supplied to the "Stromboli," in August 1844.

Previous to any application of the solution a very powerful smell, arising from bilge-water, and producing in some people sickness at stomach and headache, was from time to time experienced.

Upon such occasions the bilges were cleaned out, dried, and whitewashed, but without the effect of destroying the smell, which still recurred in wet weather, and when the ship had much motion. Since August last the solution has been used in the proportions directed by Sir William Burnett, and each time in increased quantity, the first trial not proving effectual. Upon the last occasion, on the 16th of December, 15 pounds of the solution were used with 54 gallons of water, and from that time to the date hereof, no further inconvenience has been experienced from the bilge-water, and the health of both officers and ship's company has been very good.

I have, &c.

(Signed) E. PLUNKETT, *Commander.*

Rear Admiral Sir Hugh Pigot, Knt., C.B., K.C.H.,  
Commander in Chief.

"Amazon," at Cork, February 7, 1845.

Forwarded for the information of the Lords Commissioners of the Admiralty.

(Signed) H. PIGOT, *Rear Admiral.*

H.M.S. "Stromboli," Clifden,  
January 22, 1845.

DEAR SIR,

I have this day reported officially on your solution, and I am sure you will be the better satisfied with my report, that it was not made hastily, or with insufficient trial. I waited until now, even after the last trial had freed us from that most sickening smell which we used to complain of, to see how long a time would elapse before another application was necessary; but as we still remain free from inconvenience, I do not like to delay my report. The uncertain recurrence of the smell had made it doubtful at first how far the evil was remedied; but as 35 days have now elapsed, with every change of weather and circumstance calculated to test the experiment, and it still succeeds, I think it decisive, and can only say, if Government did not allow the solution, I should provide it myself.

Pray believe me, &c.

(Signed) ED. PLUNKETT, *Captain, R.N.*

Sir W. Barnett, K.C.H.,  
&c. &c.

*Extract of a Letter from Mr. Robert Grigor, Assistant Surgeon of the "Stromboli."*

The last three trips we made, we had very bad weather and a tremendous sea running; yet, with all my diligence, I could not perceive the least smell of bilge-water in any part of the vessel. Previous to using this solution, it was almost impossible to remain below when at sea.

You will observe, that when in harbour, lying quietly at anchor, we never suffered much inconvenience from this same bilge-water; but the very instant we got under weigh, especially if there were any sea, we were glad to betake ourselves to the quarter-deck; there is no longer any necessity for this.

Her Majesty's Steam Vessel "Porcupine,"  
Woolwich, February 27, 1846.

SIR,

Having yesterday proceeded on board the "Eclair," and examined her minutely in every part, not the slightest disagreeable odour could be detected; but, on the contrary, a pleasant, wholesome, and reviving smell of chlorine gas, evolved from the solution, which appeared to have been plentifully used; and although the bilge-water has remained for a considerable number of days in her holds without being



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disturbed, and would, under ordinary circumstances, have become very fetid and disagreeable, not a vestige of any unpleasant smell existed. I obtained some bilge-water from the holds, which had not only been purified in smell, but in colour also.

I have further to inform you that your solution has been applied to the holds of the "Porcupine," (in which vessel I have the honour to serve,) and although a very short time has elapsed since its application, the disgusting effluvia which previously existed is now entirely removed; indeed, its effects appear to be instantaneous, for, on the morning after applying the solution, not the slightest fœtor existed; and, as a further proof of its perfect success, plate, gold lace, and other metallic substances, now retain their colour and brilliancy, which before could never be kept from tarnishing—evidently showing the corrosive principles are also removed; but, above all, the health of the ship's company has already improved, and their comfort has been much enhanced by the removal of the deleterious and highly offensive effluvia which were emitted previous to the application.

I have, &c.

(Signed) R. P. CHAPMAN, Assistant Surgeon.

Sir W. Burnett, K.C.H., &c.,  
Director-General of H.M. Navy.

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*Extract from a Letter from Captain F. Bullock, R.N., commanding H. M. Steam Vessel "Porcupine," dated Woolwich, March 30, 1846.*

The "Porcupine" is still as sweet as a nut, and I congratulate you upon the success of the patent, for its effects were really magical, and seemingly durable. It was, however, a formidable affair, I can assure you, and caused us some bad sick head-aches. We shall watch this process narrowly, and will make you a prompt report by and by.

Ever faithfully, &c.

(Signed) FREDERICK BULLOCK.

---

*Dr. M<sup>c</sup>William to the Secretary of the Admiralty.*

3, Oakley-place, Southsea, Hants, September 17, 1846.

Sir,

I have the honour to enclose a certificate from Commander Gallwey and the officers of H.M.S. "Rapid," relative to some experiments which I made on board that ship, to destroy the offensive smell of bilge-water in the hold, by means of Sir W. Burnett's patent solution.

The result was quite satisfactory, after a fair trial was made. On the first occasion the experiments failed, owing to the flow of the solution into the pump-well being stopped, by an accumulation of various matters under the limber-boards. On this being removed, and the solution allowed to pass into the pump-well, the success was most convincing and complete.

I am, &c.

(Signed) J. O. M<sup>c</sup>WILLIAM, M.D., Surgeon, R.N.

"We, the Commander and Officers of Her Majesty's sloop 'Rapid,' have witnessed experiments made by Dr. J. O. M<sup>c</sup>William, to test the efficacy of the Burnett solution in destroying the disagreeable odour arising from bilge-water in the hold of this vessel.

"The 'Rapid' experienced very bad weather in the passage from Plymouth to Madeira during February, and the early part of the present month. The bilge-water smelt most offensively, particularly from the air-holes in the gun-room cabin.

"On two occasions since that time the solution has been employed; the last time it was used the pump-well was thoroughly dried, and the solution was forced, by means of a small engine-pump, under the limber-boards in the fore part of the ship, and ascertained to flow aft into the pump-well.

"It was also forced through the air-holes to the sides and lower parts of the ship. The result is, that there is now no smell of bilge-water in any part of the ship; on the contrary, she seems everywhere quite sweet and clean.

"(Signed) H. J. W. S. GALLWEY, *Commander*.  
W. G. FISHER, *Senior Lieutenant*.  
W. H. BALLENTON, *Master*.  
EDWARD HEATH, *Surgeon*.  
G. J. STARR, *Paymaster and Purser*.  
W. M'CLUNE, *Master's Assistant*.  
EDMUND GLYNN, *Lieut., taking passage.*"

*Relative Merits of the Chloride of Zinc and Chloride of Lime as tested in the "Lord Auchland" Convict Ship. Extracted from the Journal of the "Lord Auchland."*  
—March, 1847.

The chloride of lime I have always used very extensively, and although it has counteracted disagreeable smells by creating one of its own, I have never found it so beneficial or lasting in its properties as the chloride of zinc. In the first place, the effluvia arising from the former application is anything but pleasant; and, so soon as the smell of chlorine has ceased to pervade the apartment, I have invariably found that the noxious smells became as prevalent as ever; indeed, a few hours after its use, we have had the disagreeable smells from the closets descending the prison-deck; and, although used twice a-day, morning and evening, and scrubbed into the wood-work and left wet, it has not been a sufficient safeguard against the strong urinous and other smells from the round-houses.

With the chloride of zinc solution there is no unpleasant smell whatever, it not only eradicates the fætor from close and confined places, but produces a sweetness and an agreeableness in the air between decks; the lasting effects of one application keeps everything pure for full 48 hours, which I could never obtain by the chloride of lime.

(Signed) BENJAMIN BYNOE, *Surgeon, R.N.*

*Extract from the Nosological Return of Mr. Thomas Gibson, Surgeon of H.M.S. "Eurydice," between October 1 and December 31, 1846.*

In one of the cases, that of an angry sore, the chloride of zinc was had recourse to, in the proportion of one part to four of water, which produced an eschar, and on suppurating the ulcer assumed a healthy appearance, continuing to improve under a very weak mixture of the chloride of zinc and water.

The economy of the ship has been to keep between-decks well aired by wind-sails, the decks cleaned by dumb-scraping, keeping the pump-well dry by pumping it out twice in the 24 hours, and occasionally introducing a portion of the chloride of zinc, which had a most marvellous effect in removing and destroying the offensive effluvia of bilge-water; also seeing that the crew have proper clothing in night-watches, and in wet weather.

In addition to the above remark on the usefulness of the chloride of zinc, I may observe, that on the "Eurydice" joining the channel squadron, after being re-commissioned in August last, the smell of bilge-water was very offensive, proceeding from the pump-well, and from the hold on being opened. Solution of chloride of zinc, according to the instructions of the director-general of the medical department of the navy, of 22nd January, 1846, was thrown down the pump-well, previously dried. On being pumped out, the well and hold became sweet; the carpenter of the ship, who had been in her during the previous commission, expressing himself surprised, and remarking that the smell of bilge-water was always in the ship, and could never be got out of her till now. I may also observe, that on the passage out, the pump-well



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becoming somewhat offensive, I called the attention of Lieutenant Mends (senior lieutenant of the ship), Dr. S. J. Graham, and Mr. Charles T. Kevern, supernumerary surgeons for the African squadron, to the state of the water on being pumped out, and previous to the introducing of the solution. The following evening, on examining the pump-well and water pumped from it, to their agreeable astonishment, both were found free from the offensive effluvium of bilge-water.

"Sirius" Steam-ship, London, February 16, 1846.

DEAR SIR,

I consider it a duty I owe to Sir William Burnett to state to you, that his solution for doing away with the noxious smell of bilge-water—so disagreeable at all times to passengers and other persons on board, has been tried in this ship with the greatest possible success. At one time, such was the offensive smell, that no person could remain long in the cabin without having the ports up and stern-windows open—not always available in bad weather; but since using the above solution it has completely done away with every bad smell of the kind; and I do strongly recommend every ship-master never to be without a quantity of it on board for sweetening his vessel. It has my decided approbation, and you are quite at liberty to make use of this letter in any way you may deem fit, as an inducement to all and every person afloat to make use of this invaluable cure for all purposes that may be necessary to sweeten his vessel.

I am, dear Sir, your very obedient servant,  
(Signed) I. MOFFATT, Commander.

C. Jackson, Esq.

*From W. F. Daniell, Esq., to Sir William Burnett.*

London, September 15, 1847.

I am happy to state that during my recent residence in S. W. Africa, I have derived great aid and advantage from the use of your solution of the chloride of zinc, not only in removing the fetid and offensive smell of the bilge-water to which all merchant vessels are liable more or less, but also in preserving the wooden framework of European houses from the depredations of numerous insects and worms which in particular destroy those portions embedded in the soil. Timber once immersed in this solution, even for a brief period, appears to be exempt from most of the ill effects of an African climate. The factories, therefore, become more durable, and hence one great source of expense in their continual re-erection is thus avoided. In a hygienic point of view I am much indebted to its utility when sufficiently diluted, by applying it in the form of a bath to the skin; and I can assure you not only myself, but most of the men under my charge who have been obliged to reside in unhealthy localities, concur in giving it a high character from the decided benefit which has resulted from its regular employment.

I remain, my dear Sir William, yours ever sincerely,  
(Signed) W. F. DANIELL.

Sir W Burnett, K.C.B.,  
&c. &c.

*Extract of a Letter from E. Elliott, Esq., Assistant-Surgeon, R.N., to Sir William Burnett.*

The "Vanguard," "Albion," and "Rodney," were all at Malta during the greater portions of February and March, 1847. The two latter were cleared out, and thoroughly caulked, but the after-hold of the former was only cleared, which was well swept, dried, and then thoroughly imbued with the solution of chloride of zinc, used according to the directions, so that it might come in contact with the whole of the surface, and the remainder of the proportion supplied was injected by means of the fire-engine, through the skin of the vessel into every part, fore and aft, and would consequently be applied to a large proportion of her timbers, as well as under

the lining, about the keelson and wells; but this course was not pursued in either of the other vessels: in the "Albion," a small quantity was simply sprinkled in the after-hold, and in the "Rodney" I could not learn that it had been used at all, or, if so, not sufficiently to produce any good results.

All these vessels sailed about the end of March for the coast of Greece, and were employed there, and among the Greek and Ionian Islands, until their return to Malta early in October. During this period they were exposed similarly to the same causes, in neither was leave given to the ship's company, by which any diseases might have been introduced from intemperance while on shore; and almost the same discipline was observed;—they had all been upwards of two years in commission, and nearly similar hygienic rules respecting the cleansing of decks were observed in each; and yet the comparative immunity which the "Vanguard" enjoyed from disease, and the small number of her sick list, was the general subject of remark among the medical officers of the fleet. She was not more roomy or better ventilated than any of the others, indeed perhaps less so, as they had each a scuttle abaft the mainmast, through which a windsail passed to the after-hold, which she had not; all were equally crowded with supernumeraries, yet on going on board either of them there was a marked difference in the sweetness of the ships below, and their freedom from unpleasant smells.

In both the "Albion" and "Rodney" the effluvia from the after-holds, which contain salt provisions, was very disagreeable, and the smell of the bilge-water rendered the cock-pit cabins scarcely habitable to the officers, blackening not only the white paint, but tarnishing gold lace. The diseases which occurred in these vessels assumed a more severe type, especially on board the "Rodney," and the numbers on the sick list of each were generally double that of the "Vanguard." Now to what can this immunity and this difference be attributed? After much reflection on this point, and viewing it in all its bearings, I can come to no other conclusion than that the chloride of zinc, used as it was in the "Vanguard," must have produced some effect, and is entitled to its full share of credit in contributing to this singular freedom from those diseases which may originate from effluvia, arising either from stagnant water, or the evolution of deleterious gases during the decomposition of animal or vegetable substances in the holds of ships.

I have the honour, &c. &c.

(Signed) ERNEST ELLIOTT.

To prove the correctness of the statements made in the preceding letter, the reports from the "Rodney," "Albion," and "Vanguard," were referred to, and the comparative rate of sickness found to be as follows:—

Department of the Director-General of the Medical Department  
of the Navy, January 17, 1848.

A Comparative QUARTERLY STATEMENT of the SICK of the following Ships, extracted from the Nosological Returns received into Office during the year 1847.

| Ships' Names. | Number Sick.            |                           |                           | Total Number Sick, during 9 Months. | Of Diseases frequently influenced by causes within ships of War, there occurred on board the under-mentioned, as follows. |             |             |         |
|---------------|-------------------------|---------------------------|---------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
|               | Lady-day Quarter, 1847. | Mid-summer Quarter, 1847. | Michaelmas Quarter, 1847. |                                     | Fevers.                                                                                                                   | Erysipelas. | Rheumatism. | Ulcers. |
| Rodney .      | 243                     | 194                       | 279                       | 716                                 | 55                                                                                                                        | 11          | 37          | 40      |
| Albion .      | 156                     | 210                       | 204                       | 570                                 | 48                                                                                                                        | 2           | 33          | 42      |
| Vanguard .    | 155                     | 146                       | 113                       | 414                                 | 6                                                                                                                         | 2           | 22          | 24      |

B. P. HOBART.



*Influence of the Solution on Bilge-Water**Letter to Sir Gordon Bremer.*

Dock Yard, Woolwich, November 10, 1847.

Sir,

I beg leave to acquaint you with the result of the application of the Burnett solution on H.M.S. "Fisgard."

The condition of this vessel afforded a very favourable opportunity for testing the powers of this disinfecting agent. A truly nauseating effluvia pervaded the whole of her interior, produced chiefly by the presence of sulphuretted hydrogen gas consequent upon the liberal use of sulphur employed in smoking out the rats; so distressing were the effects of this gas, that almost all at work in her suffered from headache and sickness. The chloride of zinc was accordingly used, but only to a moderate extent; within a short space of time, not a trace of unpleasant odour was perceptible, and the ship became perfectly sweet and wholesome.

I am, Sir, your very obedient servant,

J. N. DERRIMAN, M.D., *Assistant-Surgeon.*

Commodore Sir Gordon Bremer.

H.M.S. "Hastings," Rio de Janeiro, August 31, 1848.

Sir,

We beg leave to submit to you the following report upon the properties and efficiency of the solution of chloride of zinc, supplied for the use of Her Majesty's ship "Hastings," previously to her departure from England as flag-ship on the East India Station. The "Hastings" sailed from England on the 1st July, 1848, and before clearing the English Channel, encountered some rough weather; soon after which, a smell, of an unusually foul and unpleasant nature, began to arise from the pump-well, holds, and fore-cockpit. Several bucketsful of the solution diluted to the proper proportion, were poured down beneath the fore-cockpit close to the stem, and it was repeatedly and liberally distributed in the pump-well, but only with partial and temporary effect, for in twenty-four hours after each application, the effluvia returned with almost undiminished pungency, though the ship was regularly pumped out every morning, and the pump-well itself kept as dry as possible in the intervals, by having stoves daily placed in it.

The lower tier of tanks, and the ballast which had been stowed in the hold several years before the ship was commissioned, have not been disturbed since, and it was probable that such an accumulation of various substances might have taken place around and beneath them during that period, as, combined with heat and moisture, could scarcely fail to generate effluvia of a highly offensive character, and afforded at least a very probable clue to the source from whence the smell emanated. On the 9th July last, a case of small-pox showed itself, which soon assumed the confluent form; the sick list, already amounting to 55, was daily increasing, and as it became imperatively necessary to leave no means untried that might tend to arrest the progress of the disease, and improve the health of the crew, and seeing that little or no benefit had resulted from the previously limited application of the solution of the chloride of zinc, the surgeon recommended that it should be distributed through the interior of the ship, on the largest scale compatible with the quantity supplied to her, and with a due regard to reserving a portion for any peculiar contingency that might afterwards arise.

Two hundred and forty gallons of mixed fluid were accordingly (in the proportion of one part of the solution supplied to twenty parts of sea water) prepared, and previously to its application on the 14th July, the ship was pumped out, and the pump-well baled as dry as possible. The forcing-pump and fire-engine were used, and by their means the solution was forced into every part of the bottom of the ship which it was possible to reach; the nozzle of the pipe connected with the hose having been first directed into every opening between the beams in the wings communicating with the limbers, and afterwards led through the fore-cockpit, and pointed under the floor of the fore-magazine. Two hundred and twenty gallons were thus disposed of, the remaining twenty having been poured round the step of the mainmast. The good effects of the solution not being obvious at first, five days were allowed to elapse before it was pumped out, and for five weeks subsequently, during

the greater part of which period the ship was within the Tropics, and experienced various changes of weather, little or no disagreeable smell was perceptible—a result, in our opinion, chiefly attributable to the application of the solution of the chloride of zinc.

We beg to express our decided conviction of its efficacy; and although various other means of ventilation were used simultaneously with the solution of chloride of zinc, we are of opinion that the improved condition of the lower parts of the ship has been mainly owing to the employment of the latter.

We have, &c.

(Signed) J. W. MORGAN, Captain.  
J. H. COCKBURN, Commander.  
R. T. C. SCOTT, Surgeon.

Sir W. Burnett, K.C.H.,  
&c. &c. &c.

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*Extract from the Nosological Return of A. C. Air, Esq., Surgeon of H.M.S.  
"Scourge," for Christmas Quarter 1848.*

"The use of the solution of chloride of zinc has been frequently required in various parts of the ship, for the purpose of removing the smell of bilge-water and other effluvia, so as to maintain her in a wholesome state.

"It has been applied in the usual manner and with good effect; but since the expenditure of this article during the last six months has been unusually large, it may be proper briefly to refer to the reason, and leave a more detailed explanation of the subject for the annual remarks.

"Steamers will, in general, require a more liberal supply of this preparation than other vessels of equal size, because their structure, and the nature of the operations which take place in them, will favour the accumulation of bilge-water and dirt, and the generation of deleterious gases.

"But there are certain causes which tend to produce such results very speedily in this ship, and render necessary a more frequent application of the fluid than is usual. These causes exist both in the parts abaft and forward, and depend on the structure of the vessel, but differ slightly from each other. In the aftermost part, the fault is one which cannot be completely obviated by the resources of the ship, and can, therefore, merely be palliated. There is no means of providing a free circulation of air through the parts beneath the steerage and gun-room, the aftermost coal-bunker completely intercepting communication with the fore part of the ship, and the hatches and gratings in the steerage not being capacious enough to ensure an adequate supply of fresh air and its proper circulation. The consequence is, that, notwithstanding all precautions to keep these places clean and dry, a very unpleasant exhalation is found to arise from them: the small quantities of offensive and deleterious gases, which inevitably proceed from the bottom by evaporation, collect in the confined space. There is no facility for promoting the removal of these gases, their tendency to be diffused through the more wholesome atmosphere around them is retarded by the want of a free current of air, and they must necessarily accumulate and become more concentrated. In the fore part, some of the limber-boards beneath the magazine cannot be removed, on account of the proximity of the floor of the magazine to the bottom of the ship. Notwithstanding these disadvantages, however, which have demanded a comparatively frequent renewal of its application, the solution of chloride of zinc has proved much more beneficial in its agency than the preparation of lime. Without at present laying stress upon the absence of any unpleasant odour, its chief advantage has been the greater permanence of its protective influence. It not only decomposes the noxious gases so as to remove the offensive odour, but by its action on the substance of the wood, and penetration into the interstices of the timber, it counteracts, for a longer period, the tendency to the exhalation of injurious compounds; whereas the chlorinated lime was chiefly efficacious in decomposing (by the rapid extrication of chlorine) gaseous compounds already existing. Even this immediate effect is produced less perfectly by the chloride of lime than by the chloride of zinc, and the more distant operation of the former as a means of protection is much less valuable than that of the latter."



*Influence of the Solution on Bilge-Water*

H.M.S. "Spy," Ascension, November 29, 1848.

Sir,

In compliance with the directions issued by you, to report on the chloride of zinc, I beg leave to state the following:—

On lifting the scuttle of a small store-room beneath my cabin, on the 1st November, a most insufferable effluvium immediately arose, and disseminated itself throughout the vessel.

On search being made, the cause of it was discovered to be the bursting of a case of preserved meat, and the escape of its contents, which, from exposure to air, had become putrid.

It immediately occurred to me that it would be a favourable opportunity for trying the chloride of zinc, and, after the store-room had been thoroughly cleaned, I used it in the manner directed by the pamphlet. In about twenty-four hours, the effluvium had entirely left the lower deck, and in five days was imperceptible in the store-room itself.

Of the powers of the chloride of zinc, as a deodorizing agent on this occasion, all the officers on board were fully convinced.

I have, &amp;c.

(Signed)

GEORGE WILLES, Assistant-Surgeon.

*Extract of a Letter from Dr. W. Loney, Surgeon of H.M.S. "Amphitrite," dated September 2, 1848, from Ascension.*

"I have the honour to enclose you Captain Eden's testimonial of the usefulness of the solution of chloride of zinc as a disinfecting agent; and I would add, that its easy and simple application, together with its perfect freedom from the strong and disagreeable smell of chlorine, which attended the old process of purification by the evolution of that gas, ensures it a readier application on board ship than it would otherwise meet with, which, for obvious reasons, is no small recommendation."

## ENCLOSURE.

H.M.S. "Amphitrite," Ascension Roads,  
September 1, 1848.

I hereby certify, for the information of the Lords Commissioners of the Admiralty, that the chloride of zinc solution has been regularly used on board the "Amphitrite," in conformity with the instructions accompanying the supply, since the 1st May last, and with the best results.

The offensive smell of sulphuretted hydrogen from the bilge, which existed previous to this date, ceased altogether after the first few applications, and to the regular use of this deodorising agent, I feel warranted in attributing the continual total absence of all noxious effluvia.

(Signed)

THOMAS RODNEY EDEN, Captain.

H.M.S. "Pluto," July 10, 1848.

Sir,

In consequence of the intolerable smell of bilge-water which has pervaded this vessel since the return of her being commissioned, I represented to the commander the necessity of the holds being cleared out, in order to have them cleaned and sprinkled with the solution of chloride of zinc; the provisions, stores, &c., were therefore, on the 22nd of June, got upon the upper deck at sea, during our passage between Madeira and the Cape de Verde Islands.

We found the holds tolerably clean, but upon taking up the limber-boards or flooring which covers over the keelson, an immense quantity of exceedingly foetid, black thick dirt, was discovered underneath, having more the appearance of night soil which had lain in a sewer for a long time, than anything else. This dirt was found fore and aft the ship, but less of it under the engine-room than elsewhere; and, upon a fair computation, forty-five bucketsful were altogether taken out, besides what was pumped out, dissolved in the water which was let into the ship in order to cleanse her. Upon the limbers and limber-holes being well scrubbed with brooms,

and rinsed out by means of a powerful engine-hose, they were carefully swabbed up, and then I caused the solution, mixed in the proportion of 1 to 20, to be applied to every part of the vessel from which the dirt had been taken; and as I considered this an extraordinary case, I used eighty-four gallons of the dilute liquor.

The result of the above cleaning and application of the solution has been, that ever since we have been perfectly free from the smell of bilge-water.

I have, &c.

(Signed)

JOHN A. CORBETT, *Assistant-Surgeon in charge.*

Sir W. Burnett, K.C.H.

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H.M.S. "Thisbe," Hamoaee, February 16, 1849.

DEAR SIR,

The solution of zinc which you recommended to me, to purify and to do away with the bad smell from the bilge-water in this ship, (caused, no doubt in a great measure, from her being injected with coal-tar,) I am happy to say, has been efficacious. The nauseous unhealthy odour at once disappeared on using the solution, by throwing it over the holds from the ship's fire-engine. It was also successfully used, I am informed, on board Her Majesty's ship, "Vanguard" and "Hamadryad."

For the last twelvemonth, or since their being injected with the solution of zinc which you so happily recommended to me, both these ships have remained perfectly sweet, and clear from any unwholesome effluvia, either from bilge-water or from coal-tar, and I have no doubt but that its more frequent use on board Her Majesty's ships in the Tropics, and on board emigrant ships, would be the means of rendering them more wholesome and comfortable, by removing those effluvia which oftentimes are the cause of fevers both in ships and in other crowded situations.

I remain, &c.

(Signed)

CHARLES HALL, *Commander.*

Ernest Elliott, Esq.,

Assistant-Surgeon, H.M.S. "Agincourt."

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Brig "Thames," Liverpool, February 8, 1849.

SIR,

I have much pleasure in reporting having used Sir William Burnett's disinfecting fluid, according to your directions, a jar of which you sent me on board for the purpose of trying its effects in purifying bilge-water, and neutralizing the nauseous effluvia arising from a cargo of hides and tallow, on my homeward voyage from Buenos Ayres.

I found it completely to maintain the character you gave me of it before leaving England. By using it occasionally, whenever the smell became disagreeable, it completely removed all causes of complaint, and rendered the ship sweet. From having noticed these good effects, I strongly recommend its use for such purposes on board vessels.

I am, &c.

(Signed)

JOHN S. RUTHERFORD,

*Owner and Commander of the Brig "Thames."*

The Secretary of

Sir W. Burnett's Patent.

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*Extract of a Letter from Dr. T. S. Beveridge, Surgeon of H.M.S. "Imaum," dated Port Royal, December 31, 1848.*

"When the chloride has been used as directed, it has been of decided benefit, and answered indeed admirably.

"I would call attention to the fact, that it will be found of great use when a vessel is being painted, a period when many suffer from headache, &c.: the disagreeable smell of the paint, the chloride of zinc completely removes. I have found this to be the case on experiment."



*Influence of the Solution on Bilge-Water*

*Extract from the Journal of James Allan, Esq., Surgeon of H.M.S. "Juno," between October 1, 1848, and February 4, 1849.*

"There have been 114 cases under treatment, 111 of which have been cured on board, and two sent to hospital. This extremely low ratio of mortality is not, however, the only important feature in the preceding nosological synopsis. It also shews the total suppression, and disappearance of certain forms of zymotic disease, which almost constantly existed in the ship from the time she was commissioned in September 1845, till September 1848. From the different returns transmitted during that period, it will also be collected that these diseases prevailed to the greatest extent, and in the most aggravated form, among the men who were employed in and about the holds, not one of whom escaped an attack of fever. With respect to the cause, or causes of these fevers, it may be stated, that (especially while serving on the coast of Mexico) the patients had been subjected, from the peculiar nature of their duty, to great bodily fatigue at a very high temperature, and, for at least twelve out of every twenty-four hours, I have no doubt breathed a highly vitiated atmosphere; for, notwithstanding the greatest attention to ventilation, whitewashing, cleanliness, and the use of chloride of lime, the effluvia of bilge-water emanating from the holds was frequently almost intolerable. Whether this was the sole cause of the fevers, or that by its sedative action it only promoted the absorption into the system of other deleterious gases produced by the decomposition of organic remains, and not perceptible to the sense of smell, (for malaria, though frequently, is not always or necessarily, associated with stench,) it is at present difficult, if not impossible, to determine.

"Whatever may have been the nature of the cause, there can be no doubt that it was generated in the holds, and (from the proofs already stated of its noxious activity) that it existed there in a more concentrated form than elsewhere. These are the principal facts connected with the sanitary condition of the ship up to the 30th September, 1848.

"Early in the following month, a supply of the solution of chloride of zinc was procured, the use of which not only completely annihilated the offensive emanations, formerly complained of, but fever has wholly disappeared, not a single case having occurred during the whole period of this journal, even among those men who were formerly so obnoxious to its attacks.

"As the influences of climate, diet, clothing, discipline, cleanliness, ventilation, &c., have been essentially the same during the last three years, no reasonable person can, I presume, arrive at a conclusion very different from that already submitted in a previous report, and which further experience has tended to confirm;—that to the invaluable deodorizing and disinfecting properties of this agent, the surprising improvement in the health and consequent efficiency of this ship's company, was principally, if not solely, attributable."

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*Extract from the Journal of Mr. James Booth, Surgeon of H.M.S. "Thetis," between March 18, 1849, and July 16, 1850.*

"We were at times a good deal annoyed by bilge-water, and although the character of the chloride of zinc is already completely established, I would make a few remarks on its use. We were of opinion that there were some unsound pieces of wood about the port-side of the after-part of the ship. When there was any smell of bilge-water anywhere, it was sure to be indicated in the master's cabin; but his inconvenience was short, for a single bottle of the diluted fluid, in proportion of one to twenty, poured down the lining, acted like a charm: positively in about a quarter of an hour after its application the acutest olfactories, and we had some sharp ones, could not detect it in that cabin, although in the next adjoining it might continue powerful. Of course, while thus locally applied, it must be frequently repeated; and, unfortunately, some are too indolent to use it, and it really is attended with some degree of inconvenience. I would, therefore, beg leave to recommend that each vessel should be supplied with two, or more in large ships, injecting syringes of good size and power, with flexible tubes of convenient length, and that the openings into the ship's lining should be fitted with a sort of catch, to which the nozzle of the tube could be fixed and unfixed with ease and expedition. Some such arrangement I conceive

necessary if it be wished to do justice to the chloride, as I believe it must come into actual contact with the enemy; and I also fully believe that the less trouble its use may cause, the more likely it is to be used, and I do not think there is any fear of its being used unnecessarily. In conclusion I have only to say, that it destroys offensive smells much more effectually and speedily than the chloride of lime, and that, too, without producing an almost equally disagreeable one. I had always doubt whether the chloride of lime did not, to some extent at least, merely *drown* the smell; but with the zinc there can be no mistake."

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H.M.S. Steam Frigate "Sampson," Hamoaze, October 25, 1849.

"We, the undersigned officers belonging to H.M.S. "Sampson," feel great pleasure in recording our conviction of the complete and permanent effect which the injection, by means of a small fire-engine, of Sir William Burnett's solution of the chloride of zinc has produced in destroying the stench of bilge-water from this ship, which was previously of a most nauseating, offensive character, and had resisted all the usual means employed for its removal. More than four months have elapsed since it was done; the success is most complete; she is now as free from smell in every part as a ship can possibly be; and we beg to suggest that if such means were generally adopted to render the holds of ships free from these injurious smells, it might contribute much to the healthiness of all on board.

(Signed)

ROBERT JAGO, *Chief Engineer.*  
RALPH THOS. TECTOR, *Assist.-Engineer.*  
JNO. TUCKER, *Carpenter.*

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Letter, dated 5th February, 1850, from Dr. T. Frazer, Surgeon of H.M.S. "Wellesley."

Porto Espano, Trinidad, February 5, 1850.

Sir,

In the last Nosological Report from this ship, viz., for the quarter ending the 31st December last, it is mentioned that a few days previous to the end of the quarter, the bilges, *from being perfectly sweet*, suddenly began to emit a very offensive effluvia, blackening the paint on the orlop and lower decks, and, as I have since learned, causing headache and nausea in several of those who mess or have cabins in the cockpit, to escape from which they were obliged to leave their cabins and berths, and to sleep in the lockers in the gun-room, in the offices, and along the main-deck. Some of the officers were also obliged to leave the gun-room table, unable to partake of dinner from the effects of the effluvia. It is further stated in the return that "*this change in the state of the bilges* was attributed to a quantity (69 gallons) of rum having been accidentally spilled in the spirit-room, which, mixing with the bilge-water, and other matters that may have been there, gave rise to a more rapid process of decomposition," and that "the holds, spirit-rooms, and coal-holes were being cleared out, and the limber-boards raised, preparatory to using the solution of chloride of zinc as a remedy."

With reference to the above passages, I now beg to report, that on the 3rd of January these places being cleared, some of the tanks emptied and removed, the water, which was black and offensive, pumped out, and the boards over the limber-passages raised, they were thoroughly washed with the solution, (diluted with twenty times the quantity of fresh water,) it being thrown by means of a force pump against the lining and bulk-heads, injected between the lining and sides of the ship, over the flooring, and along the limber-passages into the well. It was then pumped out, and the holds well dried by means of stoves, and ventilated by wind-sails for 48 hours. Eighteen gallons of the solution having been used for the purpose.

This seemed effectually, and almost at once, to have destroyed the smell, but to make all sure, 10 gallons more of the solution were similarly applied, and on being pumped out appeared clear and limpid. After this second oblation, the holds, &c., were left clear until the 7th, to let them become thoroughly dry, when they were restowed, and the tanks refilled.

We then prepared for sea, and on starting from Bermuda on the 22nd ultimo, ex-



*Influence of the Solution on Bilge-Water.*

perienced a stiff breeze (marked 8 in the log) from the S.W., varying to west and N.W., with a considerable sea, and running before the wind with studding-sails on both sides, we had much rolling motion, yet not the slightest effluvium has since been emitted, though we lay at anchor 50 hours at Barbadoes, and have now been at anchor here about two days, the water from the well continuing quite sweet, and even clear and limpid.

I have, &c.

(Signed)

Sir William Barnett, K.C.B., K.C.H.

THOS. FRAZER, M.D., Surgeon.

*Letter from Dr. E. H. Derriman, Surgeon, H.M.S. "Plumper," dated 18th May, 1850.*

Port Royal, Jamaica, May 18, 1850.

SIR,

Having had frequent opportunities, during the past twelvemonths, of testing the efficacy of the chloride of zinc as a disinfectant and purifying fluid, I have now the honor of communicating to you the results.

In consequence of the fitting of a piece of timber across the fore-part of the hold, in connection with Mr. Grant's new cooking apparatus, the pumps are prevented acting upon the bilge-water which collects forward, and being thus pent up it gradually accumulates and decomposes, giving rise, from time to time, to a most noxious effluvium, which rapidly spreads throughout the ship; the only alternative then is to remove the superincumbent mass of stores, to get the fetid collection well bailed out, the limbers washed, and a solution of the chloride pumped in. When this has been effectually done, the result has been invariably most satisfactory, the intolerable stench has been removed, the paint-work no longer discolours, and for some time not the slightest evidence of the existence of the noxious gases is perceptible, till the water again accumulating, decomposition gradually takes place, followed by its accompanying train of evils, and at length again necessitating the proceedings above described.

I have, &c.,

E. H. DERRIMAN, M.D., Surgeon.

Sir William Barnett, K.C.H.  
&c.      &c.      &c.

# ACTION OF THE CHLORIDE ON DIFFERENT KINDS OF OFFENSIVE EFFLUVIA.

To obtain a substance harmless in itself, and free from smell, but possessed of the property of destroying other smells, particularly such as are offensive or injurious to health, has long occupied the attention of scientific men, but until the solution of the chloride of zinc was brought into use, it may be safely asserted that no such boon had been extracted from the secret stores of nature. Under this privation we had become accustomed to the employment of various things that are not only ineffectual, but in a large majority of instances positively obnoxious to the senses, detrimental to health, and even, occasionally, dangerous to life. Such, for instance, are the fumes of corrosive acids, which from their irritant effect on the bronchial tissue, can never be inhaled without considerable risk by those who are suffering from disease of the lungs. These fumes or gases are in other respects highly objectionable, from the injury they occasion to the better sorts of furniture. The well known bleaching properties of chlorine render it totally inapplicable where there are tissues consisting of silk, cotton, or wool of delicate dyes. The colours it would instantly destroy, and if used to a moderate extent, it would even act upon the fabric itself.

Chloride of lime was at one time extensively used for the dispersion of foul odours in close places, and as a fumigating or disinfecting agent, in the chambers of the sick, but without the slightest advantage. It has therefore of late been almost entirely discarded from use within doors; the smell arising from it being moreover to many people more insufferable than those it has been required to correct; and as it only partially covers other effluvia, without in the least degree destroying them or preventing their evolution, it thus becomes an aggravation of the evil sought to be got rid of. The smell of vinegar, although grateful and refreshing, yet when mixed with the tainted air of a sick chamber, or the wards of an hospital, where offensive animal effluvia are seldom absent, also becomes exceedingly disagreeable and sickening. Equally offensive, if not more so, is the smell from burning rags; a mode of fumigating that has too frequently been resorted to in the humbler walks of life. Pastiles, although they are seldom burned in the presence of the sick, yet they are sometimes used to cover offensive odours,—the principle, in fact, on which nearly the whole of these articles have been employed, and the only advantage they are capable of affording.

Considering the acrid poisonous nature of several substances with metallic bases, the introduction of secret chemical compounds for purifying the wards of hospitals, and the dwellings of the poor, cannot be too strongly condemned; yet a preparation of lead, which possesses some slight power over certain noxious effluvia, has been proposed for general use as a disinfectant. Whatever its properties may be in this respect, and it is assumed they are not great, there are few people



acquainted with the danger of sleeping, while in sound health, in a newly-painted room, that would consider the sprinkling of a solution of one of the salts of that metal in the wards of an hospital, anything but a very dangerous and an unwarrantable procedure. As the vapours of the preparations of mercury, when diffused in the atmosphere, speedily affect the human constitution, so, in like manner, will those of lead produce obstinate colic, paralysis, and permanent decrepitude in those exposed to them. The danger attending the application of the solutions of lead, mercury, and arsenic, to superficial sores, is well known to every medical man; in an equal degree should the community be advised of the danger of these poisons when applied directly to the body, diffused in the foul atmosphere of an ill-ventilated house, in the wards of a crowded hospital, or between the densely-peopled decks of a ship.

The following documents refer principally to the action of the solution of chloride of zinc on certain effluvia or malaria from which contagious diseases sometimes arise, and also as to its effects in correcting the offensive odours of all natural or morbid discharges from the living body, or such as pervade the wards of hospitals, the chambers of the sick in private life, or adhere to the necessary apparatus or utensils used in these.

*Wm. Smith, Esq. to Sir Wm. Burnett.*

Watford Union, March 13, 1847.

SIR WILLIAM,

I beg to inform you that at a meeting of the Board of Guardians on Wednesday last, to which meeting the Guardians had been specially convened to consider and determine what should be done with a view to remedy a nuisance arising from the offensive state of the privies and cesspools at the workhouse, Lieut. Jackson attended the Board with a small quantity of your concentrated chloride of zinc, and suggested whether the solution might not be advantageously used to neutralize the noxious effluvia. The quantity brought to the workhouse was not sufficient to admit of experiments being made upon the great body of filth in the cesspools, and therefore a pailful of the most feculent matter was removed from one of the privies, and a quart of the preparation, diluted with two quarts of water, was put into it, which in the space of a minute removed the offensive odour.

The Guardians regarded your preparation as preferable to the chloride of lime for the purpose to which it had been applied, and requested me to suggest to you that it would be most desirable to have the preparation tried upon privies, and such like receptacles of filth, in order to ascertain whether it might not be successfully and economically applied in purifying such places. We have now been favoured by Mr. Majoribanks, a member of our Board, with an additional supply of your chloride, and will try some further experiments with it.

I have, &c.,  
(Signed) WM. SMITH, *Chairman of the Board.*

*John Long, Esq. to Lieut. Jackson.*

Watford Union, Monday, March 15, 1847.

SIR

I herewith enclose the MS. copies of the testimonials as requested, and beg to state that I have tried the chloride of zinc only on a small scale (in one drain): in this instance in a few minutes it had a very beneficial effect. By sprinkling, and leaving a small quantity in a cup in one of the sick wards, it manifested in a striking manner its superiority to chloride of lime, which we formerly used. The pail of feculent matter which was taken from the privy on Wednesday last I have still preserved,

and it remains as inoffensive as when the solution was first mixed with it. I purpose to-morrow to wash the whole of the drains and wood-work near, and will then draw the attention of our Board of Guardians, and request their report of its merits.

(Signed) JOHN LONG, *Governor of the Workhouse.*

Royal Naval Hospital, at Haslar, July 12, 1847.

Sir,

In compliance with your directions to us to report on the use of Sir William Burnett's fluid as a disinfectant, or as to the removal of noxious smells, we have to inform you that it has been used in this hospital in the close-stools of patients affected with dysentery, in the water-closets and cesspools, and also in the wards, when the air was tainted by purulent expectoration or discharge from sores, with the effect of immediately removing the disagreeable odours. It has also been used in the surgery with good effect, in removing the smell of putrefying animal substances, the odour of dead bodies under inspection, and when employed as a dressing to ulcers, it removes the disagreeable smell of purulent matter. In the proportion of one part of the clear solution to eighteen of water, it preserves subjects of natural history from putrefaction, and in a fit state for anatomical inspection, after more than a year has elapsed, or as long as our trials of it have lasted. We have had no contagious or epidemic diseases in the hospital, by which its powers of arresting infection might be tested; but it has been used, much diluted, for sponging the skin of patients affected by fever, with evident benefit, and the immediate removal of the odour of perspiration; and as it is itself inodorous, it is in no way offensive to the patients.

We have, &c.,

(Signed)

JOHN RICHARDSON, *Medical Inspector.*

J. ANDERSON, *Medical Inspector.*

JAMES ALLAN, *Deputy Inspector.*

ALEXANDER M'KECHNIE, M.D., *Surgeon.*

ALEXANDER STUART, *Assisting Surgeon.*

Captain Superintendent Sir W. E. Parry.

Royal Marine Infirmary, Woolwich, July 2, 1847.

Sir,

The solution of the chloride of zinc has been used in this hospital for a considerable time past. It has been employed both as a disinfecting agent, and to remove offensive odours. Of its powers in the former capacity the opportunities which have offered here of testing them, have not been such as to enable a decided opinion to be given; but of its utility as a destroyer of all kinds of offensive effluvia, there occur daily the most satisfactory proofs. Formerly the patients and others suffered annoyance from the use of the close-stool in the wards, notwithstanding the care which was then taken to prevent it; a disagreeable odour likewise clung to the water-closets, which were proof to constantly repeated ablutions; but since the chloride of zinc has been introduced into daily use, these inconveniences have entirely disappeared. Patients whose cases require it may now be accommodated without discomfort either to those around them or to the medical attendants, and the water-closets can now be kept free from the slightest taint.

The great advantage which the chloride of zinc possesses over other agents employed for a like purpose, is that it removes the disagreeable effluvia without leaving one little less offensive in its room, and may therefore be made use of wherever this effect is required,—in private as well as public buildings, in the sick-bed chamber no less than in the crowded ward. The method adopted at this hospital is to supply each of the wards with a bottle of the diluted solution, which the nurses have directions to use whenever occasion may require, besides sprinkling it over the floors before the morning and evening visits are made.

I have, &c.,

(Signed)

THOMAS NELSON,

*Assistant Surgeon, Royal Marine Hospital.*

Sir William Burnett, K.C.H.,

&c. &c. &c.



*Action of the Chloride on Offensive Effluvia.*

Her Majesty's Ship "Vengeance," Portsmouth, June 13, 1847.

SIR,

Having used the chloride of zinc rather extensively on board Her Majesty's ship "Vengeance," whilst employed in the conveyance of troops, I think proper to report to you the result thereof. We carried the 1st battalion of the 42nd regiment, consisting of about 700 men, women, and children, from Malta to Bermuda. Measles had prevailed epidemically in the regiment previously to their embarkation, but we received none on board labouring under the disease; yet, after being ten days at sea, several cases occurred simultaneously among the soldiers, and on the 1st of April, having been then a month at sea, the disease appeared among our own people, 10 cases occurring on that day, and from that day to the 15th of the month, when we arrived at Bermuda, fresh cases were almost of daily occurrence either among our own people or the troops. On getting rid of the troops, which we did at Bermuda, my attention was of course specially directed to every means whereby the contagion could be destroyed. Cleanliness and ventilation were duly attended to, and every part of the ship where the sick had been, after being cleaned and aired, was sponged well over with the solution of chloride of zinc several times. Than the result, nothing could be better; the disease totally ceased, no fresh case occurring after. On our passage from Halifax, with the 60th regiment on board, the weather was so bad, and the ship working so much, that it was quite impossible to open any of the lower-deck ports, on which deck the whole of the people lived, troops as well as our own people, for eight days; the air throughout the deck was exceedingly vitiated with every mixture of noxious smell, but the free use of the chloride of zinc tended, in a most surprising manner, to do away with the bad smell, so much so that the surgeon of the regiment came to me to get some to use in the part of the ship where the ladies of the officers were. The effect of the chloride of zinc is most obvious in correcting all bad and offensive effluvia; and, from the sudden and surprising manner in which the measles disappeared after its use, it is not, I think, too much to say that it must have been very instrumental in decomposing the miasm, or state of atmosphere in the ship, which tended to the generation of the disease.

It has struck me, Sir, and I hope you will not deem the observation out of place, that it might be most beneficially used in the fever hospitals in Ireland at the present time, and more especially in the houses of the better classes of the people there, where fever now so much prevails. After washing and airing rooms where fever has been, the best way to use it would be, to sponge the boards well over with the solution, and allow the moisture to dissipate itself with free ventilation.

I have, &amp;c.,

(Signed)

B. VERLING, Surgeon.

Sir William Burnett, K.C.H.,  
&c. &c.

*Extract of a Letter from Dr. Lindsay, M.D., Deputy Inspector of Hospitals, dated July 15, 1847, to Sir William Burnett.*

As it may facilitate your arrangements to have the reports as quickly as possible I enclose herewith the first I have received, and will enclose the others with my own in an official form as soon as I procure them. I was with the medical officers in some of the Cork hospitals yesterday, and have been promised reports from them on my visit to-morrow, which, if I receive in time for post, I will transmit in the evening.

ENCLOSURE.

MY DEAR DR. LINDSAY,

Clarence Place, Cove, July 15, 1847.

In accordance with your wishes, and for the information of Sir William Burnett, I beg to state to you the result of my observations on the effects, as a disinfecting agent, of Sir William's preparation, "the chloride of zinc."

I have had it used pretty extensively during the last three weeks in our fever hospitals in this place, with the concurrence and under the united observation of my honourable colleagues, Dr. Scott and Surgeon Cronin.

I commenced its general and exclusive use on Sunday, the 20th June, chloride of lime having been previously in use; and have no hesitation in distinctly stating that I found it a powerful agent in speedily removing all noxious, unwholesome, and offensive smells, arising both from the external and internal excretions of a number of persons

occupying the same room, and which will arise, no matter how well soever ventilated such apartments may be.

This effect of the use of chloride of zinc was not only observable in all the wards of both hospitals, but in the yards, necessaries, and cesspools.

That the purification of the air should have much influence in modifying the character, and in mitigating the severity of a disease (by many, very many, supposed to be contagious), is an axiom very extensively, if not generally, admitted.

How far such influence has been exercised by the use of the chloride of zinc on the cases of disease under treatment, during the time before specified, I leave to you and others to draw your and their own conclusions from the facts which I am now about to state.

In the month ending June 15th, 83 persons of both sexes were treated in hospital; of these, 10 died. Whereas, from June 15 to this day, July 15, there were admitted 162, of those, 4 died (3 males and 1 female), 94 were discharged cured, and 64 remain under treatment.

Of those who died in this latter month, one was a very old man, a long confirmed drunkard; one a boy of cachectic constitution from infancy, and one a woman with pneumonic complication.

You have seen how many (almost all) of those cases were of a severe typhoid character.

At present we can be hardly said to have one dangerous case.

As regards dysentery, I have no opportunity of testing the effects of the chloride on the alvine discharges, as we do not receive such cases in our hospitals.

Now to my observation of its use and effects amongst some of my private patients:—

In five houses of respectable persons labouring under typhus, its power of destroying (quickly) all bad and offensive smells, struck the nurses and others as very remarkable, and in each of those cases the impression left upon my own mind is, that it very beneficially modified the character of the disease.

On this latter subject I have frequently of late stated to you my impressions; but the time and numbers are too limited for me to be able to express a decided opinion.

On the whole, I think that Sir William Burnett may be well satisfied of the great value, as a disinfecting agent, of the preparation which he has brought under the public notice.

Believe me, &c.,

(Signed)

JOHN J. CRONIN.

Dr. W. Lindsay, Deputy Inspector of Hospitals,  
&c. &c.

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*Extract of a Letter from Professor Quain, of University College, dated March 29, 1847, addressed to Sir William Burnett, K.C.H.*

"Allow me to take the opportunity of stating that I have used for some time your antiseptic fluid, in the treatment of sloughing tumours, with beneficial effects. I have no doubt it will supplant the chloride of lime and soda altogether in the removal of foetid odour. Those substances give an odour of their own, which is very disagreeable in itself, and still more so as suggestive of the object for which they are used; moreover, they do not wholly remove the fœtor. Your fluid is far more efficient, and is without smell.

"I have reason to believe, too, that the fluid produces other advantageous effects on some forms of disease; but my experience in this way is as yet too limited to speak positively. I want all I can get of fungoid diseases, to put its virtues fully to the test."

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8, Mervue Place, Cove of Cork,  
July 17, 1847.

SIR,

In compliance with your desire, that I should try the efficiency of the solution of the chloride of zinc as a disinfecting agent in destroying noxious smells emanating from putrid and decaying animal and vegetable matters, and in correcting offensive



*Action of the Chloride on Offensive Effluvia.*

smells where large bodies of men are congregated together, I have now to state the result of the trials already made in some of the civil hospitals of this neighbourhood, and as the experiments are still in progress, the result of further experience will form the subject of a future report.

On receiving your first communication, in June last, I applied to the medical officers of the Fever Hospital in Cove, to allow me the necessary facilities, and in this establishment the trials have been fully and fairly carried out, and are still going on.

This hospital is well situated, having no other buildings in its immediate vicinity, with the exception of a shed in addition, for the better accommodation of patients, and all in its details is exceedingly well conducted; it is well ventilated and beautifully clean. Nevertheless, the use of the chloride appears to me to have considerably increased the comfort of the patients by preserving the air of the wards in a pure and fresh condition, destroying the smells emanating from their bodies, from the bed pans, and privies. The wards have been constantly sprinkled with the diluted solution; portions of it were put into the pans of close-stools, and the privies were well washed with it from time to time, taking care that it comes in actual contact with the matters in those receptacles from which the noxious smells emanate.

The patients admitted into the Cove Hospital are mostly all labouring under fever of a typhoid form, many of them with the characteristic eruption at the beginning, and petechiæ appearing during the progress of the disease, accompanied by great debility, feeble pulse, and all the other symptoms of bad typhus.

The rate of mortality, however, has been exceedingly low since the use of the chloride of zinc was commenced, and if any conclusion can be drawn from a three weeks' trial of it as a disinfecting agent, it must be highly in its favour.

I herewith enclose a report from Dr. O'Connor, physician to the Cork Union Workhouse: he has also used the chloride of zinc extensively in that establishment, and as the greater number of his patients have been labouring under dysentery of a severe and fatal form, you will be glad to find that it has also been of much service there.

In some other of the large establishments it has also been in use, but not for a sufficient length of time to be reported on. As soon as I receive the opinions of the medical officers I will transmit them.

I have, &c.,

(Signed)

W. LINDSAY, *Deputy Inspector.*

Sir William Burnett, K.C.H.,  
&c. &c.

## ENCLOSURE.

I have used the solution of the chloride of zinc extensively in the hospital of the Cork Union Workhouse, dysentery being the disease at present most prevalent in our wards. I found it most effectual in correcting the factor which was previously a source of inconvenience to the attendants, and a cause of much evil to the patients, frequently depriving them of all appetite for food. If no other advantage resulted, I would consider this a sufficient recommendation for its use, but I feel convinced, from the total annihilation of all disagreeable smells, followed by a pleasing freshness in the atmosphere of the apartments where it is used, that it must have qualities of more importance than the mere correction of factor. I have used it extensively in convalescent wards recently opened for the sick discharged from the several hospitals of the city, and I have not found any relapses to occur, though such had been the character of the disease. Whether this result is entirely or in part attributable to the use of the solution I cannot state positively, as I have used it from the first time the wards were opened, and must trust more to lengthened observation to convince me on this subject.

(Signed)

D. W. CONNOR, A.B., M.D., L.R.C.S.I.,  
*President of the Cork Medical Society, Physician to the  
Cork Union Workhouse.*

34, South Mall, Cork,  
July 16, 1847.

*Report of the Physicians of Cat Fort Fever Hospital, Cork.*

We have used Sir W. Burnett's solution of chloride of zinc (a quantity of which has been kindly supplied us by Dr. William Lindsay) at the Cat Fort Fever Hospital, Cork, and found it eminently successful in destroying noxious smells. We have also employed it to preserve dead animal matter, and gladly testify as to its value when so applied.

It possesses an evident advantage over the solution of chloride of lime, besides that it leaves no stains, and is itself free from smell.

JOHN W. P. FLYNN, M.D.

P. J. BARRY, M.D.

*Physicians to Cat Fort Fever Hospital, Cork.*

ROBERT RUFFE, *Apothecary.*

July 24, 1847.

*Letter to Sir William Burnett.*

100, Great Portland-street, August 24, 1847.

Sir,

I have much pleasure in bearing testimony to the efficacy of your solution of chloride of zinc, in purifying the air of sick chambers, to the great comfort both of the attendants and the patient.

In diseases attended with a foetid discharge I have used the solution as a lotion with immediate and complete success. In the case of a child afflicted with perforation of the intestine, and from which a most offensive faecal discharge is constantly escaping at the umbilicus, the solution has proved of the greatest benefit; the smell formerly occasioned nausea, which he is now relieved from. Solutions of the chlorides of lime and soda corrected the evil, but they substituted an odour scarcely less disagreeable than the original one.

The solution has proved of the utmost service in a series of experiments I have been engaged in for some time. To prepare and preserve animal substances in a state fit to be brought to a consistency approaching petrification, a circumstance of paramount importance is that no trace of putrescence should appear, otherwise disintegration of fibre and destruction of the objects are the certain effects. No preparation which I have tried (and I have used almost every metallic and earthy solution) has proved so convenient and successful as the chloride of zinc; it neither changes colour, form, nor texture. It also arrests putrefaction when it has already commenced. A mass of animal substance, into which the chloride has well penetrated, may be removed from the solution and dried in the open air, without the slightest fear of decomposition. This effect also is permanent, for if the substance be again wetted and kept in a damp place, still putrefaction does not commence. When its powers are more known I am persuaded it will supersede every fluid used for preserving or disinfecting.

I have the honour to be, Sir, your obedient servant,

GEORGE WILSON.

*Erasmus Wilson, Esq., F.R.S., to Sir William Burnett.*

55, Upper Charlotte-street, Fitzroy-square,  
August 21, 1847.

I am happy to be enabled to make a most satisfactory report of the solution of chloride of zinc. I have employed it in some bad cases of chronic ulcer and of scrophulous ulceration, attended with an overpowering odour, with the effect of not only removing the bad smell, but also of promoting the healthy process in the sores. In one of my cases the entire house was tainted with the smell, and the attendants were all ill; the day after the use of the solution every trace of disagreeable odour had fled. The strength which I have found best adapted for these purposes is one part in 130. I also find the fluid admirably suited for the preservation of animal substances.

I am, &c.,

ERASMUS WILSON, F.R.S.,

*Consulting Surgeon to the St. Pancras Infirmary.*

Sir William Burnett, K.C.H.



*Action of the Chloride on Offensive Effluvia.**Report of the Physicians of Barrack-street Fever Hospital, Cork.*

SIR,

In accordance with your request, we have tested, in the Barrack-street Hospital, Sir William Burnett's disinfecting fluid, of which you were so obliging as to send us a specimen.

We have found it particularly efficacious in correcting fœtor in fever and dysentery wards, and consider it, for that purpose, superior to all other chemicals hitherto used, inasmuch as (unlike chloride of lime or soda) it substitutes no other disagreeable odour for that rendered imperceptible or destroyed.

Nor does it necessitate (as in the case of nitre and vitriol) the elimination of noxious gas, rendering, in a different way, the air of the sick wards impure.

Of its disinfecting power, or ability to destroy infectious miasmata, we do not as yet feel competent to speak.

JOHN JEFFRIES, M.D.

JOHN MURPHY, M.D.

*Physicians to the Barrack-street Fever Hospital.**J. Drummond, Esq., to Dr. Lindsay.*

Glenties, October 8, 1847.

Being fortunate enough to procure from you, while at Killybegs, a quantity of Sir William Burnett's patent disinfecting fluid, and having given it a careful trial in the workhouse in this Union, I can fully agree in opinion with others as to its disinfecting properties. The dormitories to which I directed your attention when here, from which I stated to you all the cases of fever were sent to the infirmary; in these apartments you requested me to give the chloride of zinc a fair trial, which I have done, I must tell you that it succeeded beyond my expectation. The unpleasant smell ceased after it had been used for a short time; and very few cases of fever have since been admitted from this part of the house. The number of deaths by fever and dysentery have also decreased. This I mainly attribute to the chloride of zinc, with proper attention to ventilation. It has been used one part in thirty.

Believe me your's truly,

(Signed)

JOHN DRUMMOND.

William Lindsay, Esq., M.D. &amp;c.

*Letter from Dr. Cronin.*

Clarence Place, Cove, September 24, 1847.

MY DEAR SIR,

A period of two months or nearly so having elapsed, since I ventured to express an opinion on the value of chloride of zinc as an adjuvant in the treatment of disease, or as a powerful means of rendering the air wholesome or pure in hospitals or the houses of the sick, by destroying bad smells, I think it desirable to inform you as to whether any change of that opinion then expressed may have, from extended observation, become necessary.

Anything occurring since has tended most strongly to confirm those opinions.

While fever remains unabated, another formidable and loathsome disease has sprung up, which in the numbers attacked, and its severity, surpasses any epidemic that has occurred in this country for half a century—I mean dysentery.

In every case of public and private practice, whether of this disease or fever, the effect of the diluted solution of chloride of zinc, in removing the fœtor arising from the excretions, and the noxious smells generated in the air of the wards and rooms, has been almost magical.

Although I have not been able to come to any more decided conclusion as to its curative powers, in fever or dysentery, I must only allow you to deduce your own inferences from the fact that in our hospitals, since I last wrote to you, over 350 cases of fever have been treated, and only six deaths have occurred; while outside, of over 400 cases of dysentery, not more than four deaths have occurred, two of those in very old people, and two infants.

I could not observe that the use of the chloride prevented the spread of disease, or checked its progress, though I do still think that it had and has some modifying influence on disease during its course. On the whole it is a most valuable agent as a means of purifying the air of crowded and ill-ventilated rooms, &c.

I am, my dear Sir, most truly yours,  
(Signed) JOHN J. CRONIN, M.D.,  
*Physician in Charge, Cove Fever Hospital, Infirmary and  
General Dispensary, and Acting Surgeon to Artillery and  
Ordnance in Cork Harbour.*

W. Lindsay, Esq., M.D., Deputy Inspector of Naval Hospitals.

*Report from J. Popham, Esq., A.B., M.D., &c.*

I have freely used the "disinfecting liquid" of Sir William Burnett in the large hospital of the North Infirmary and the Union Workhouse of this city, and have found it of infinite value as a sanitary agent. The wards appropriated to acute dysentery and malignant fever, hitherto, notwithstanding the utmost attention to cleanliness and ventilation, so invariably offensive from animal effluvia, have been rendered comparatively pure and innoxious by the assiduous use of this remedy. Though judging as yet from a limited acquaintance with this agent, I see much ground for hope that a more extended range of experience will render its benefit far more important than the well-ascertained advantage at present attached to it.

(Signed) JOHN POPHAM, A.B., M.D.,  
*Physician to the Cork North Infirmary  
and Union Hospital.*

Cork, September 28, 1847.

LORD AUCKLAND has been pleased to grant Sir WILLIAM BURNETT permission to publish the following letter, relative to the use of the solution of chloride of zinc, as a sanitary agent.

*Letter from Dr. Lindsay Deputy Inspector of Hospitals, R.N., to the Right Hon.  
the Earl of Auckland, G.C.B., &c. &c. &c.*

London, October 29, 1847.

MY LORD,

When at Cove of Cork in September last, you did me the honour to request that I should make some notes regarding the use of Sir William Burnett's solution of the chloride of zinc as a sanitary agent, as you said you were desirous of ascertaining its real merits. Having used it myself under a variety of circumstances, and having observed it extensively used by others in several of the public establishments for the treatment of the diseases of the poor in Ireland, I am satisfied that the following points have been fully established by experiments.

1st. In destroying noxious effluvia emanating from privies, cesspools, drains, sewers, and other receptacles of filth, the application of the diluted solution has been most successful. To ensure its full effect, the fluid must be brought into actual contact with the bodies from which the noxious smells emanate, and the more extended the surface to which the solution is applied the more speedy the result. In one very offensive privy and drain connected with it, in which I used the diluted solution, during the hottest part of last July, the noxious effluvia was entirely removed in less than half an hour; and although there was no further application of the fluid, the place remained free from any perceptible smell for more than a week.

2nd. In removing the noxious smells arising from the excretions of patients labouring under typhus fever, dysentery, and other diseases, and also from the offensive discharges of extensive sores, in cleansing the mouth and teeth during the progress of fever, and in correcting the smell of the breath and saliva in mercurial sore mouth, and speedily causing the gums to heal, it has been eminently successful.

3rd. In surgical practice it has proved of great value. In a case of gangrene of the foot extending up the leg, treated in the temporary Naval Hospital at Haulbowline,



although the foot and part of the leg had been dead for many days before the part was removed by amputation, by surrounding the dressings with the cloths wetted with the diluted solution, the putrid smell was completely subdued, much to the comfort of the patient, the attendants, and other persons in the same ward. In this case the gangrene was far advanced when your Lordship visited the hospital, I believe you did not detect any bad smell.

In a case of severe compound fracture of the leg in the civil hospital at Cove, where the discharge was very profuse and horribly offensive, the solution of the chloride of zinc was used with a similar result.

4th. In purifying the air of badly ventilated wards and apartments, where many sick persons were congregated together, and the atmosphere contaminated during the process of respiration, and by the exhalations from the skin, the air has been deprived of all disagreeable odour, and kept in a fresh condition, by constantly sprinkling the diluted solution upon the floors; and in some bad cases of fever and dysentery upon the bedding of the sick. The patients have invariably expressed themselves as much refreshed by its use, and in many instances earnestly desired a continuation of it. The appetite was also restored in many cases where it had previously been destroyed by nausea arising from impure air, and thus far it has proved a valuable adjuvant in the treatment of disease.

In the present state of chemical science it is impossible to say what action the chloride of zinc has upon that *entity* called *miasma*, or the matter or matters formed during the progress of diseases of a decidedly contagious nature, and only known to exist in the secretions, and exhalations of the sick, from their power of transmitting disease from one individual to another; yet from its powerful effect in arresting the process of putrefaction, and destroying the noxious effluvia arising from animal and vegetable matters while in a state of decomposition (universally acknowledged to be a prolific source of disease) it is an agent of infinite value.

It is a well-known chemical fact, that hydrogen in a nascent state combines with many bodies with which it is in contact at the moment of formation, and carries them with it into the atmosphere. Sulphurated hydrogen is often formed under those circumstances, and in small quantity exercises a most deleterious influence on the health of man and the lower animals. When diffused through the atmosphere in a larger proportion, death itself often follows; more than one instance has occurred lately in London, where this latter effect was produced in a very short space of time. The energetic affinity of chlorine for hydrogen renders their existence in the atmosphere in a separate state impossible, and the reaction of the chloride of zinc on the gaseous compounds of hydrogen, and of ammonia, causes a mutual decomposition, by the combination of the chlorine of the one body with the hydrogen of the other, and thus neutralizes the noxious influence of the compounds of the latter.

I may also observe in conclusion, that the chloride of zinc, being itself free of all unpleasant odour, and its metallic base quite innocuous, no injurious or unpleasant effect follows the use of it.

I have the honour to be,

My Lord,

Your Lordship's most obedient servant,

W. LINDSAY, M.D., Deputy Inspector.

The Right Hon. the Earl of Auckland, G.C.B.  
&c. &c. &c.

From R. Carmichael, Esq.

Rutland square, Dublin, Nov. 6, 1847.

MY DEAR SIR,

I deferred referring to your letter, relative to the use of chloride of zinc as a disinfecting agent, until I had sufficient opportunities of ascertaining its value.

As a disinfecting agent, I can form no positive opinion, but as a most powerful means of removing the fœtor arising from animal and vegetable substances in a state of decomposition or putrefaction, I can most positively state that its powers were to me, and others who witnessed them, most convincing and satisfactory.

I had a solution that Mr. Jackson left, diluted in a proportion of one to ten of water, which removed in a short time an abominable stench that was almost insupportable to remain exposed to, even for the shortest space of time; and this it effected

without leaving in its place any other unpleasant effluvia, like that which the chloride of lime produces. From which circumstance it is reasonable to conclude that it does so by a chemical decomposition of the carburetted hydrogen gas, or whatever other emanations may arise from animal substances in a state of decomposition. Therefore, we may infer, that it is in all probability a disinfecting agent.

I am, &c.

(Signed)

RICHARD CARMICHAEL.

Sir William Burnett, K.C.H., F.R.S.,  
&c. &c. &c.

Extract from "The Builder," December 18, 1847.

FIRST PROCEEDINGS OF NEW SEWERS' COMMISSIONERS.

The first general court of the Commissioners of Sewers, appointed in pursuance of the recommendation of the Metropolitan Sanitary Commissioners under the Great Seal, was held on Thursday, in committee-room No. 8, House of Commons. Present—The Right Hon. Lord Morpeth, M.P., in the chair; the Right Hon. Lord Ashley, M.P., Mr. J. Walter, M.P., Hon. F. Byng, Sir E. Buxton, M.P., &c.

The surveyors, Messrs. Phillips and Roe, presented reports: a number of men had been employed in flushing and cleansing cesspools, particularly in Turnmill-street, and that this had been effected by the use of ordinary fire-engines, the hose of which had been inserted in the place proposed to be discharged; and, by the use of Sir William Burnett's chloride of zinc, all odour arising therefrom had been completely destroyed.

Notes by Dr. McWilliam, R.N., who attended the following experiment, which was made with the view of fairly testing the powers of the solution over the effluvia liberated from feculent matters.

January 26, 1848, P.M.

Cesspool in Westminster-yard (which from information from an official hard by, had not been opened for twenty years), 6 feet long, 4 feet broad, and 7 feet deep.

The cesspool was brimful, therefore the mass to be operated upon by the solution consisted of a cube of ordure = 168 feet, which was treated in the following manner:—

A quantity of paper, straw, and other fibrous matter, was raked up from the surface, with the effect of causing the mass to emit a most insufferable smell; I say insufferable, because the hydro-sulphate of ammonia, and other gases, were so abundantly evolved, as to drive us back from the privy door. Mr. Glass, at this time, directed the nozzle of a tube connected with a forcing pump, containing the solution (diluted with 50 parts of water), to the surface of the contents of the privy, and the power of the solution in destroying the gases was evident in a very few minutes, for all of us could enter the privy with little annoyance, while the smell in a coal-house next door was horrible, from the quantity of gas that had escaped before the chloride was applied. When a sufficient quantity of the solution had been poured in to fluidify and deodorize a stratum of ordure, say a foot deep, the nozzle of a hawse, perforated at the end with small holes, was plunged into the mass, and the fluid contents were drawn off by means of a double action pump; by continuing this process the cesspool was emptied.

On breaking ground, at every fresh stratum, the stench was most noisome; but it was instantly annihilated the moment the solution fairly penetrated the mass. After this, I need hardly say, that when the privy was emptied, it was perfectly free from smell.

The quantity of solution used was less than I had expected, eight quarts only being required; thus  $8 \times 50 = 400$  quarts, or about  $112\frac{1}{2}$  gallons to liquify, so as to be penetrable, a tolerably solid cube of 168 feet. On examining narrowly the matter operated upon, there was no ocular evidence of chemical action; a sulphuret of zinc must, I presume, be formed, but the precipitate is white, and is not discernible in the colouring matter of the animal substance.

There was not either, so far as any present could discover, any proof of the formation of a new gas (as in many instances of chemical re-action) appreciable by smell.



*Action of the Chloride on Offensive Effluvia.*

ling; the only change being a gradual and steady diminution of the offensive smell, until this was completely annihilated.

There were two other gentlemen present during about an hour; they went away quite satisfied with the experiment, even so soon as that; for the process occupied  $2\frac{1}{2}$  hours, the liquified mass having to traverse about 180 feet of hawse before it was discharged into a drain outside.

The following observations refer to the preceding experiment, which was also attended by the Very Reverend the Dean of Westminster :—

*From the "Daily News."*

## METROPOLITAN COMMISSION OF SEWERS.

A meeting of the Commissioners was held yesterday in one of the committee-rooms in the New Houses of Parliament. Viscount Ebrington occupied the chair. Among the gentlemen present were Dr. Buckland, Mr. Broderip, Mr. E. Chadwick, Sir E. N. Buxton, Professor Owen, and Mr. Leslie.

Dr. Buckland observed, with reference to the deodorising fluid, that he had made various experiments with the inventions of Sir W. Burnett and the other gentlemen. He had commenced with that of Sir W. Burnett, and the result was perfect. He had ascertained that to annihilate the odour in four cubic yards of fluid, it would require ten quarts of the deodorising fluid, and the time occupied in the process would be two hours. He had, however, no doubt that, when the operations were conducted more upon system, they would be able to do twice as much work in a day as at present. He begged to put in a written statement of his experiments.

*Letter from J. G. Williams, Esq.*

Sir,

London, April 30, 1849.

In compliance with your letter to me, to report on the effects of the chloride of zinc, I have to inform you that it was used most extensively in the "Kinnear," female convict ship, on the passage out to Van Diemen's Land, and always with satisfactory results.

This valuable solution has a more immediate effect in destroying putrid and offensive effluvia, arising from animal and vegetable decomposition, than any previously known; and it is capable of being applied with equal facility, economy, and success. It possesses striking and incontestible advantages over every other means yet employed for the disinfection of crowded ships, for the destruction of noxious smells, and deleterious gases arising from reservoirs of urine and excrementitious matters; in short, for the total destruction of every species of infectious effluvia and offensive odour on board ship, as I can witness, having had daily proofs of its marvellous and immediate effect when brought into actual contact with any noxious matter. The round houses, and the ladders that descended from them into the prison (hitherto great sources of annoyance in female convict ships) were daily washed with a diluted solution; the consequence was, that these retreats were kept free from the urinous and feculent odour which is invariably attached to such places.

I was also in the habit, especially within the tropics, while the ship was becalmed for three weeks, and where Fahrenheit's thermometer some days stood at  $92^{\circ}$ , daily to sprinkle the prison deck with the solution of chloride of zinc, in addition to the scrubbing it got three times a week with the same solution. In rainy, muggy weather, the stench below was sometimes very great, until the solution was applied as above: all unpleasant, musty, or close smell was then instantly removed, and the atmosphere of the prison rendered wholesome. So delighted were the females with its purifying effect, that they frequently craved for its application to the deck, upon the least unpleasant odour occurring in the prison. In stormy weather, when the hatches were obliged to be kept on, and to prevent water from going below, the scuttles in the prison closed, I was in the habit of hanging, in different parts of the prison, pieces of blankets wetted in the solution: in this manner the air below was rendered pure, and

fit for respiration. In the hospital abaft, the solution was used, if possible, more freely than in the prison; frequently in the course of the day it was sprinkled on the bed-clothes of the sick. Seven cases of dysentery occurred on the passage out, and I have no doubt, but for the disinfecting properties of the chloride of zinc, many more cases of this formidable disease would have happened.

In a diluted form, as I have frequently experienced, it is an admirable application to fetid ill-conditioned ulcers with a foul discharge. Lastly, I have no hesitation in recording, from my own experience, that a greater boon than its purifying and disinfecting properties has not been offered to mankind for a length of time, but more particularly to seafaring men. Every ship-master can now, with very little trouble and expense, keep his ship (always abounding, more or less, with noxious smells) pure and wholesome, and consequently, his crew and passengers healthy.

It is an agent far superior to that of the chloride of lime and soda—possessing no smell of its own, immediate and almost permanent in its effect; whereas, the effects of lime and soda are protracted in their operation, leaving a worse smell than that which was attempted to be subdued by their agency.

I have, &c.

JOHN G. WILLIAMS, Surgeon, R.N.,  
Late of the "Kinnear" Convict Ship.

Sir W. Burnett, K.C.H.,  
&c. &c. &c.

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*Extract from the Journal of G. D. McLaren, Esq., Surgeon of H.M.S. "Belleisle," 1848.*

"I now consider it my duty to speak of an agent to which the comfort and health of all on board the 'Belleisle' have in no small degree to be attributed—I allude to the solution of chloride of zinc.

"This ship having been employed for a period of two years and half in the conveyance of troops to different parts of the world, will at once appear as having been peculiarly adapted for further proving the value of this solution.

"It was extensively used in different parts of the ship; but it was chiefly in the gun-room, where the women and children were located, and between decks, in bad weather at sea, when the air became replete with noxious effluvia, that its beneficial qualities were most striking. The most offensive odours were instantly destroyed by it, and the air made pure and refreshing. The employment of this valuable agent, combined with the necessary points of economy formerly mentioned, was certainly the means of adding much to the comfort, and consequently the efficiency of the ship, and no doubt it also had much influence in maintaining the health of the crew."

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Montreal, February 29, 1848.

Sir,

In compliance with your request, I have pleasure in forwarding to you the following opinion of Sir William Burnett's disinfecting fluid.

I am not cognizant of any facts which enable me to arrive at a conclusion regarding the "disinfecting" properties which the name implies it to possess; and, ignorant of the nature and quality of the subtle element, to which, for convenience sake, we apply the term "miasm," developed by, and in its turn capable of generating fevers, I can offer no opinion as to any neutralizing agency which the chloride of zinc may exert upon it.

Of its deodorizing properties, however, I can speak from experience; and in this point of view I consider it a valuable acquisition in the sick chamber, the addition of a small quantity of fluid to the utensil, before recourse is had to it, effectually subjugating the offensive odour so commonly met with.

Equally beneficial will be found its use in apartments or places contaminated by offensive odours, caused by the elimination of sulphuretted hydrogen, or probably even phosphoretted hydrogen gases; its utility in these cases, as well as when employed to remove the disagreeable effluvia emitted by decomposing animal matters, as in subjects in the dissecting room, is undoubted, being the result of a chemical decomposition mutually effected.



*Action of the Chloride on Offensive Effluvia.*

I regret that I had not an opportunity to put to the test its disinfecting powers during the months of May and June of the past year, when in professional charge at the Montreal General Hospital; the crowded state of the hospital, during the latter month especially, from cases of "ship fever" of the worst description, presented an opportunity of which I may not be again possessed. The fluid, however, had not at that time arrived in the country.

Yours, &c.

(Signed) A. HALL, M.D.,  
Lecturer on Chemistry in McGill College, and one of the  
Physicians of the Montreal General Hospital

Dr. Stratton, Surgeon, R.N.

*Letter from Dr. C. A. Browning, Surgeon-Superintendent of the "Hashemy" Convict Ship, dated 26th June, 1849.*

Sydney, June 26, 1849.

With reference to your circular, dated 14th November, 1848, requiring me to direct my special attention to the qualities of the solution of chloride of zinc, considered either as a disinfectant, or as a purifier of foul atmosphere, I have the honor to acquaint you that during the seven months I have been serving in the convict ship "Hashemy," embracing *the three* in which the cholera prevailed amongst the prisoners on board, I have never ceased to make daily observations on the influence of the fluid, as used, not only in the prison, containing 237 prisoners, but in the berths of the crew, which consisted of 41, and likewise in the deck accommodating a guard, consisting of 50 rank and file, with five of their wives and four of their children, and the result is, a confirmed admiration of its power of destroying *speedily* and *completely* all unpleasant odours, even those which arise from such parts of the ship as afford them in their most highly concentrated state, and offensive character; and rendering the atmosphere agreeable and favourable to comfort, and conducive to health.

My practice in the "Hashemy" has been not only to cause the solution to be sprinkled daily on the lower deck, but to be frequently applied, by means of flannel cloths to every accessible *surface*, not only of the ship's sides in the prison, but to the beams and under side of the deck over head, as well as to all the forms and boards forming the messing and sleeping berths of the prisoners. In addition to this, flannel cloths, soaked in the solution, were kept hung up in various places round the prison, particularly where currents of air are found generally to prevail.

The places which are ever liable to afford the most disagreeable effluvia have been by the application of the fluid, in an instant freed from every trace of whatever was before felt to be offensive to the senses. At all hours of the night I have had occasion to enter the prison, and never could detect anything unpleasant in the air; and all the officers on board, and several who visited us while at the Cape of Good Hope, remarked how very clean was our prison, and how free from offensive odours. In one word I would add, that I am not able to express in terms sufficiently strong, my admiration of the salutary influence of the solution of the chloride of zinc.

To the prisoners it seemed to exert a power almost supernatural; and their opportunities of observing its extraordinary influence in purifying the air of the prison, during both night and day, were greater and more *constant* than mine. I have often been, at once amused and gratified, by their remarks and conversation with reference to the solution in question, and I am sure their expressions of unfeigned gratitude for the benefit they felt they had derived from its use, must, had they fallen upon your ear as they did upon mine, have proved highly gratifying to your mind. So deep was their sense of the utility of the chloride of zinc, and so desirous were they that its use should be introduced into all prisons, that *nine* of their petty officers, whose special duty it was to attend to the purity of the prison and hospital, were requested to communicate to me an expression of their high and unanimous opinion of its power. The document to which I refer, I beg leave to enclose.

I have, &c.

(Signed) COLIN ANOTT BROWNING, M.D.

The Director General,  
&c. &c. &c.

Convict Ship, "Hashemy,"  
Port Jackson, June 13, 1849,

SIR,

We, the undersigned, whom you were pleased to select, from among our fellow-prisoners, and appoint to do duty as petty officers among the people, who with ourselves have been committed to your kind and considerate charge, beg leave to record our thankful sense of the benefit we have enjoyed, from the use of the chloride of zinc, during our protracted voyage from Woolwich to Sidney.

We have been at once amazed and delighted by the beneficial results produced by its use, in immediately and effectually removing all disagreeable effluvia, and every trace of malaria and noxious exhalations, which will be, under the most vigilant watchfulness, sometimes generated in a crowded ship, and arise from water-closets and the holds, tainting the air, and rendering it not only unpleasant, but injurious to health. The power of the solution of the chloride of zinc in purifying the air, and rendering it sweet, refreshing, and invigorating, is so extraordinary that its effect must be witnessed to be fully conceived and appreciated. The stations we have occupied, and the duties we have been called upon to perform on board, have afforded us such frequent opportunities of noticing its valuable results, that we feel we should be insensible of, and ungrateful for, the kindness manifested towards us by those who have recommended and promoted its adoption, were we to neglect to record, and to tender to you, an expression of the deep sense we entertain of our great obligations.

We beg you will be pleased to accept this as the humble declaration of a body of 212 men, who feel they have been greatly benefited, and who are unanimously of opinion, that the use of this fluid has most materially contributed to the preservation of their health, and who desire, under an abiding conviction of its value, to express their wishes for its more general adoption in prisons, that others may experience the same advantages from its use which they feel they themselves have derived.

(Signed)

|           |                                           |
|-----------|-------------------------------------------|
|           | WILLIAM ROGERS, <i>Chief Captain.</i>     |
|           | CHARLES AUSTIN, <i>Second Captain.</i>    |
| Starboard | ALFRED TRIGGS, <i>Captain Lower Deck.</i> |
| side.     | GEORGE SMITH, <i>Ditto.</i>               |
|           | WM. FISHER, <i>Ditto.</i>                 |
| Portside, | JAMES WHITE, <i>Captain Lower Deck.</i>   |
|           | JOSEPH UNDERWOOD, <i>Ditto.</i>           |
|           | JAMES IVENS, <i>Ditto.</i>                |
|           | FREDK. E. BODY, <i>Head of Hospital.</i>  |
|           | RONALD GORDON, <i>Clerk.</i>              |

To Colin Anott Browning, Esq.  
Surgeon-Superintendent.

*Letter, dated 20th January, 1851, from Mr. R. S. Stuart, Master of the "Sir Robert Seppings," Convict Ship, to Harvey Morris, Esq., Surgeon-Superintendent of that vessel.*

Bermuda, January 20, 1851.

MY DEAR SIR,

I feel much pleasure in giving you a brief account of the "Sir Robert Seppings" since her arrival in London from the East Indies, as by so doing, I shall have an opportunity of bearing testimony to the astonishing results produced by the chloride of zinc solution. After discharging our invalids and cargo in the West India Docks, the "Seppings" was twice smoked, and nearly four bushels of rats killed, a rat-catcher was likewise employed, and paid a guinea for destroying them; the man removed a great number of the dead ones from under the limber-boards, however, he could not remove the whole, and the consequence was, that the smell from the dead rats was so intense that I was apprehensive the ship would be rejected by the Government officers at Deptford, however, Mr. Pearce, the Master-Attendant, upon ascertaining the cause of the smell, appeared satisfied; soon after this the ship was washed with the chloride of zinc solution, and within forty-eight hours afterwards she was as free from smell as any ship in the service, and has remained so ever since.

I remain, &c.

(Signed)

R. S. STUART.

To Harvey Morris, Esq.



*Action of the Chloride on Offensive Effluvia.*

*Extract of a letter, dated May 14, 1850, from Dr. James Hall, Medical Superintendent of the Convict Establishment at Bermuda, addressed to His Excellency the Governor, on the subject of Sir William Burnett's Solution of Chloride of Zinc.*

Some time since your Excellency was pleased to obtain the sanction of Earl Grey for the supply to this hospital of a certain quantity of Ledoyen's disinfecting solution, which was recommended by Lord Morpeth. Having experimented on this solution, I now have the honor to report, that I found it powerful as a deodorizing agent, and useful in speedily removing the effluvia from the dejections among the dysenteric patients, but not so quickly nor so effectual as Sir William Burnett's solution of zinc.

But I am now furnished with a fact that will prove satisfactory to your Excellency, by conveying to Earl Grey a decisive testimony in favor of the deodorizing power of the chloride of zinc solution. There lately lay in one of the wards of this ship a patient labouring under mortification of the lungs, from whose breath was exhaled so putrid an odour, that I was obliged to remove the other patients from his vicinity, nor could any means be found, by open ports, chloride of lime, &c., of freeing the ward from the horrible nauseating odour that the surface of the body and breath of this patient constantly emitted; but on using the chloride of zinc solution, and suspending over the patient a cloth wetted with it, in a few minutes the odour ceased, the patient's bed became approachable without offence to the sense of smell, and during the few days he lived, the chemical power of this solution destroyed the putrid gases most effectually.

Further proof of the expediency of the introduction of the use of the chloride of zinc solution into this establishment being, in my opinion, unnecessary, I have only to submit to your Excellency's consideration that such a supply of it may be furnished to this hospital as Sir William Burnett may consider sufficient, on your requisition to Earl Grey.

I have, &c.

(Signed)

JAMES HALL.

(Verified.)

(Signed)

H. H. JERVIS, J. P. and Deputy-Superintendent.

*Extract of a letter from Captain Wickham, the Police Magistrate at Brisbane, New South Wales, to the Colonial Secretary, dated May 4, 1850.*

"With reference to the great state of cleanliness in which the prison has evidently been kept, I was more struck with the entire freedom from close and unpleasant smells, which I had conceived to be quite unattainable where so many human beings were crowded together. Dr. Jones attributes the absence of smells to the frequent use of chloride of zinc."

*Extract from a letter from Mr. John Gibson, dated June 27, 1850.*

Freemantle, Swan River, Western Australia, June 27, 1850.

"In compliance with the circular regarding the action of the disinfecting fluid of the chloride of zinc, I have great pleasure in reporting its beneficial effects on board the "Scindian." Soon after putting to sea, a most offensive effluvia was perceived on the lower deck, arising from the sides of the ship, but more particularly from the weather side, during a breeze. Having learnt from the master of the vessel that on a previous voyage *sea elephant oil* had been a portion of her cargo, I concluded that some remnant of it, spilt about the hold, might cause this unpleasant odour; and to test the solution, after the ship was pumped quite dry, I had it freely poured down the limbers and the pump, where it was allowed to circulate for a day or two.

"In the course of a week, its sweetening effects were very evident, the foul and disagreeable smell having completely vanished, to the agreeable surprise and comfort of the people "tween decks." By an occasional repetition of this process, as well as by the daily washing down of the closets (five of which led from the upper deck), the ship continued perfectly sweet during the remainder of the voyage."

THE SOLUTION USED AS A SANITARY AGENT; ITS ACTION AND  
PERSONAL MIASMATA; AND PROBABLE INFLUENCE IN  
ARRESTING THE SPREAD OF CONTAGIOUS DISEASES.

*Copy of a Letter from SIR WILLIAM BURNETT, M.D., Director-General of the Medical Department of the Navy, to the SECRETARY OF THE ADMIRALTY.*

SIR,

*Admiralty, May 20, 1848.*

IN consequence of the numerous reports, both written and verbal, which have been made to me during the few past years respecting the application of the solution of chloride of zinc, as a disinfecting, or, at all events, as a deodorizing agent, I have been induced to request you will be pleased to lay the accompanying papers before my Lords Commissioners of the Admiralty, convinced that whatever tends to increase the comforts or to improve the moral and physical condition of the men in Her Majesty's Naval Service, will meet with their Lordships' most favourable consideration.

Presuming that the value of the chloride of zinc as a preservative of vegetable fibre is now fully established, I may be permitted to call your attention to its effects when brought into contact with noxious gases, or with putrid animal or vegetable substances evolving noxious odours, which can seldom exist for any length of time in ill-ventilated rooms, or in densely populated districts, without producing disease, and frequently contagious diseases. The application of the fluid to correct the fœtor of bilge-water is now in general use both in vessels of war and in merchant vessels, whether employed in the conveyance of goods or passengers, and, it is admitted on all hands, with the most unquestionable success. In the Peninsular and Oriental Steam Navigation Company's vessels, as stated in Lieutenant Kendal's communication previously printed, the experiment was fairly tried, so far back as 1844, and with the most perfect success. The same proof of its effects has been observed in Her Majesty's ships *Rapid*, *Rhadamanthus*, *Childers*, *Fisgard*, *Stromboli*, *Imaum*, and *Rosamond*; and in many others in which it has been recently tried.

In some of these vessels the effluvia had seriously affected the health of the people on board, causing, as in the *Stromboli*, oppressive headache, dyspepsia, and sleeplessness. Such was the relief obtained in the latter vessel, that the Honourable Captain Plunket has remarked, in a letter dated 22nd January, 1845, that were the solution not allowed by Government, he would provide it at his own cost. In the *Rosamond*, formerly the *Eclair*, the surgeon reports that the most trifling catarrhal complaints were frequently accompanied with a low typhoid form of fever, until, by the copious use of the solution, "a most noisome



foetor," which existed on the fore orlop, or troop deck, had been removed.\*

The apparent effects of the solution in three line-of-battle ships in the Mediterranean was still more remarkable.† In two of these, the Albion and Rodney, in which it was only sparingly used, the effluvia from the after-holds, in which there were salt provisions, and consequently leakage to a certain extent, was very disagreeable, while the smell from the bilge-water rendered the cock-pit cabins scarcely habitable. In the Vanguard, in which it was used according to the directions given, the surface of all the timbers and planking in the hold being thoroughly imbued with it, there was little or no unpleasant effluvia, and the number of her sick were, in consequence, less numerous, and the diseases less severe, than in either of the two other vessels employed in precisely the same duties and localities.

In a communication from Commander Ryder, of a recent date, there is further evidence of the great advantages to be derived from a proper use of the solution in steamers, particularly within the Tropics, where disease is more apt to be engendered by the accumulation and decomposition of foreign matters in the holds of these vessels, such as indeed appears to have been the case in Her Majesty's ship Growler, which was lately employed in conveying free negroes from the coast of Africa to the West Indies. The surgeon of that vessel states, that he considered the exciting cause of the fever which attacked the greater part of the crew, was the effluvia evolved from the accumulations in her holds and bilges, which (while she was being cleared out at Bermuda) was readily neutralized by the solution, and with the effect of thoroughly eradicating the disease.

The value of the solution, as a sanitary agent, I think I may be permitted to state, has been established by the most unequivocal proofs. In its presence, noxious gases are speedily deprived of their more poisonous qualities, while the odours of corrupt or diseased animal substances, even if arising from a living body, are rendered imperceptible or innocuous, if not annihilated; these gases and emanations there is every reason to believe, not only give rise to fatal and malignant diseases, but they are chiefly instrumental in conveying the infectious germs from one person to another, when from the debilitating influence of a tainted atmosphere, they have acquired that property.

By a report lately presented to the Commissioners of Sewers, the solution appears to have had a vast superiority over several other deodorizing agents employed in a series of experiments performed under their immediate inspection on cesspools and other receptacles of filth, with the view of rendering the removal of these matters less dangerous to the communities in their neighbourhood. In proof of its efficacy under these or similar circumstances, and consequently of its power over those miasmata so fruitful of typhoid fever, I have already submitted for your consideration a number of documents, in which its beneficial effects were freely admitted, and in particular I took the liberty of directing your attention to one from the Chairman of the

\* *Vide* Reports printed by Order of the House of Commons.

† See page 14.

Board of Watford Union,\* and to another from the Governor of the Workhouse of that parish;† and also to a communication from Dr. Lindsay to the Right Honourable Lord Auckland.‡ These, however, form but a small portion of the documentary evidence now in my possession relative to the deodorizing properties of the solution.

There is not, so far as I am aware, any means known by which a specific personal infection may be made perceptible to the senses in contradistinction to a fever-exciting miasm; if such an entity does really exist in a separate form, Professor Liebig supposes it most readily attaches itself to certain noxious gases, and by that means propagates the peculiar disease to which it belongs. These gases, however, as previously observed, are capable of being destroyed by the solution, and it seems not unreasonable to infer, the infection also; but if this be not admitted, it is clearly demonstrable that, from the want of a proper vehicle of conveyance, it must be rendered at all events infinitely less diffusible. In this light, therefore, the solution may be viewed as a disinfectant.§

Several instances are reported in which it was considered to have arrested or retarded the spread of infectious maladies. In September last, erysipelas began to infest the patients in the Royal Marine Infirmary, at Woolwich; it speedily acquired considerable virulence, became contagious, and carried off several men who were under treatment for other ailments of minor importance. On this being reported, I desired the Deputy Inspector to cause the vapor of the solution to be diffused throughout the wards by hanging up pieces of woollen cloth moistened with it, and by sprinkling it occasionally on the floors and bedding. In the course of a few days, after the employment of these measures, the spread of the disease was arrested, while all open sores, in the infirmary, put on a much more healthy appearance. Early in 1848, the disease in a malignant form was again introduced to this establishment from one of the ships in the river; still by the constant use of the solution it was prevented from attacking other patients; even those with open buboes escaped, a circumstance so unprecedented as to lead to the conviction of the medical officer in its disinfecting properties.

In the Royal Marine Infirmary, at Chatham, typhus fever, introduced from Ireland, appears also to have been held in check by its being freely used in the wards; and a similar result, it was considered, occurred on board the Baretto Junior transport, when crowded with troops on a passage to the West Indies.||

The great benefit derived from the application of the diluted liquid to foul sloughing or cancerous sores, stands, however, on a more sure foundation. In the Imaum it was used with the greatest benefit in the treatment of certain forms of ulcer. In cases of scrofulous ulcer, attended with an "overpowering odour," it was found in the hands of E. Wilson, Esq.,¶ to have the effect not only of removing the bad smell, but of promoting a healthy process in the sores.

In the city of Dublin Hospital its external application has been

\* See p. 24.

† See p. 24.

‡ See p. 31.

§ See pp. 45, 48, 68.

|| See pp. 47 51.

¶ See p. 29.



highly approved of, as will be observed by the communication of Professor Hargrave. Its influence on various forms of ulceration and on foetid discharges, are further detailed at pages

I cannot conclude this letter without expressing my firm belief, that a more general use of an agent so innocuous in itself, and yet so powerful in the prevention of disease, is most urgently required in all hospitals or dwellings wherever typhus fever or other contagious diseases exist, as well as in emigrant ships, where it is at all times so difficult to enforce cleanliness, or dispel foul animal miasmata even by proper ventilation.

(Signed) W. BURNETT, *Director-General, &c.*

SIR,

"Athol," Woolwich, October 1, 1848.

I think it is my duty to acquaint you of a circumstance connected with the use of the chloride of zinc, which came under my observation during the passage of this vessel to Canada, and trust that its importance will form sufficient excuse for this informal method of detailing it.

On the 10th July last, two companies of Artillery, and a detachment consisting of 279 men, together with 17 women, and 39 children, were embarked at Woolwich, on board Her Majesty's troop ship "Athol" for a passage to Quebec. The children were all under 10 years of age, and appeared healthy and in good condition when brought on board; they continued so until the fifth day after leaving the river, when one of the number exhibited unequivocal symptoms of malignant scarlatina. So rapid was the progress of the disease in this instance, that scarcely thirty-six hours had elapsed before the child was dead.

While yet this case was under treatment, three others occurred in succession, presenting the same malignant characters as the first, and all with nearly the same degree of rapidity terminated in death. As might be supposed, the greatest alarm spread through the ship, nor could I refrain from sharing it, when I considered the number of people on board, and without having the means of isolating the sick from the healthy.

I had been made aware, previous to starting from Woolwich, that scarlatina was very prevalent in the garrison, but trusted the removal from the locality, and the salutary change to sea air, would go far to remove any danger which might spring from this circumstance. In this, however, I was disappointed.

On the fifth day from leaving, as above stated, the scourge broke out on board, and in a short time carried off four children. To check, if possible, its extension, and to mitigate its virulence, various measures were concerted by Dr. Combe, the assistant-surgeon in charge of the troops, and myself, the chief of which were, free ventilation, and an abundant use of the solution of the chloride of zinc about the decks, sleeping-berths, and water-closets, but more especially in the apartment occupied by the women and children. From the first day these precautions were rigorously enforced, the succeeding cases that occurred, amounting to only six in number, assumed a milder type, and all recovered, without exhibiting one untoward or serious symptom.

The voyage continued for fifteen days after the total cessation of this formidable disease; and the whole of the detachment, with accompanying females and remaining children, were landed safe and in good health at Quebec. To assert pointedly that the amelioration of the symptoms of the scarlatina, and its subsequent entire cessation, was a direct consequence of the use of the chloride of zinc, might be thought too facts together, and regard them in the light of cause and effect. But whether such inference be correct or not,—there stand the facts. In a vessel crowded with troops, women, and children, the last amounting in number to thirty-nine, none of whom had ever suffered from the disease before, scarlatina, of a malignant character, breaks out on the fifth day from leaving harbour,—the first four cases prove rapidly

fatal, free use is then made of the chloride of zinc as a prophylactic, (and I will confess, more as a matter of duty, than with any very sanguine hope of its efficacy,) and immediately, the symptoms of the succeeding cases, only six in number, became so much milder, as scarcely to be characteristic in the last two cases of the disease; and on the twentieth day from its appearance, the disease entirely subsides, nor does a fresh case present itself during the fifteen subsequent days the vessel is at sea.

I have dwelt perhaps to an unnecessary length, in bringing under your notice the preceding facts; but the subject of disinfection is one of such importance, that I feel conscious no details will be regarded by you as either too tedious, or too trifling, which go to countenance the efficacy of any agent in producing so desirable a result.

I have, &c.

(Signed) ROBERT BEITH, M.D., *Assistant-Surgeon in charge.*

"General Palmer," Emigrant Ship, Cove of Cork,  
October 3, 1848.

SIR,

With reference to your Circular, dated the 8th June, 1848, I beg leave to inform you, that I have availed myself of opportunities, on board the emigrant ship "General Palmer," to test the power of the chloride of zinc, both as an agent for destroying fœtor, and as a disinfectant in cases of infectious disease. Twenty of the crew of the "General Palmer" slept and messed in the fore-castle, a small confined, and deep-sunk apartment, the deck over which was very leaky, the scuttles, that transmitted a glimmering light into it, were also leaky, which, together with the water taken down by the men's feet, kept the place almost constantly wet, and the moisture acting upon the matter in contact with it, occasionally gave rise to effluvia similar to the mingled fœtor of the putrid and acetous fermentations: on those occasions, the deck, after being scraped, was mopped over with the diluted solution of the chloride of zinc, which removed the offensive effluvia in the space of a few minutes. Amongst the emigrants there were fifty-eight children, many of them very young; consequently, disagreeable fœtor was often unavoidable, and, in the morning the effluvia from the sleeping-berths of the women and children was sometimes exceedingly offensive, but it was invariably removed in a few minutes by mopping the place over with solution of zinc. I may mention, also, that the Esquimaux in Hudson's Straits brought alongside the head of a walrus, so offensively putrid as to produce a feeling of stupor, and pain over the forehead, but after it had been laved for a short time with the solution of the chloride of zinc from a sponge, the fœtor was entirely removed, and it could be examined without producing any disagreeable sensation.

In the above instances the chloride of zinc removed the fœtor, not by emitting any smell itself, but by destroying, or more probably by entering into chemical combination with the fœtid gases, and that in a manner so unequivocal as to leave no doubt of its efficacy.

As a disinfectant, I tried the chloride of zinc in the case of one of the crew of the "General Palmer," who was seized with modified small-pox a few days after we left England. The place where he lay, and his bedstead, were frequently washed over with the solution of chloride of zinc; and although there were more than thirty children who had not been vaccinated on board, the disease was not communicated to any of them: this, however, might be owing to there being no communication allowed between the patient and the other people on board the ship.

Hooping-cough was very prevalent among the children on board the "General Palmer" when they landed at York Factory, Hudson's Bay, on the 21st August: immediately after they had left the ship, the lower decks and sleeping-berths were washed over with the solution of chloride of zinc. Three days afterwards, a detachment of the 6th Foot embarked for Ireland with fourteen children, who had never been afflicted with hooping-cough; and although those children immediately occupied the sleeping-berths that had been left by the pensioners' children labouring under hooping-cough, yet not a case of hooping-cough has occurred among them.

This, I think, affords presumptive evidence of the efficacy of the chloride of zinc in disinfecting the ship, after the hooping-cough patients had left her; but I must confess that I do not think it had much influence in preventing the disease from



*Influence as a Sanitary Agent.*

spreading among the emigrants' children who were exposed to intercourse with others labouring under hooping-cough.

Sir W. Burnett, K.C.H.,  
&c. &c. &c.

(Signed)

I have, &c.  
ALEX. MUIRHEAD, *Surgeon Superintendent.*

Regimental Hospital, 77th Regiment, Montreal, March 23, 1848.

MY DEAR SIR,

Since you were so kind as to furnish me with some of Sir William Burnett's disinfecting fluid, for the use of the hospital of the 77th Regiment, I have had few opportunities of testing its efficacy, further than purifying a small ward, where patients affected with small-pox had been treated, and using it in the "spitting-cups" of patients affected with phthisis. In the latter case the fetor was not so strongly experienced on examining the sputa, as before the use of the disinfecting fluid. I beg, however, to state, for your information, that I used the solution of chloride of zinc on board the freight ship "Arabian," in the summer of 1846, when in medical charge of troops proceeding from Cork to Halifax, Nova Scotia. The advantages obtained from thoroughly and effectually using it, in this latter case, was most marked; and the comfort of every one on board was greatly promoted thereby; and probably the progress of a fever, of the typhoid type, which was manifesting itself amongst some of the women of the detachment, was in some measure arrested by its timely employment. I shall not fail to communicate with you on this subject, when further opportunities occur of testing the efficacy of the disinfecting fluid.

(Signed)

Yours, &c.

Dr. Stratton, Surgeon, R.N.

GEORGE ANDERSON, *Surgeon, 77th Regiment.*

*Certificate from Captain Daly, Master of the Barque "Albion."*

Quebec, October 15, 1847.

"I certify that the barque 'Albion' sailed from Cork, with 168 passengers on board; at first, there were many fever cases; and there were two deaths, one an old man, the other a young woman; both of dysentery. We landed fourteen patients with slight bowel complaint at Grosse Isle, and most of them were soon discharged; we used the chloride of zinc daily, sometimes a pint a day; we were supplied with it by the Government Emigration Agent at Cork; we were seven weeks on the passage, and arrived at Grosse Isle on the 25th September, 1847, having left Cork on the 12th August. I am of opinion, that the use of the chloride of zinc was what kept the sickness from spreading on board the 'Albion.'"

*Extract from the Nosological Return of James Allan, Esq., Surgeon of H.M.S. "Juno," for Christmas Quarter, 1848.*

"On reference to the Medical Journal of this ship for the year ending the 30th September, 1848, it will be found that notwithstanding the copious use of chloride of lime, ventilation, &c., the effluvium of bilge-water emanating from the holds was frequently highly offensive; that those persons who were most occupied in them, (viz., the second master, and the two captains of the hold,) were all attacked with fever, and that two of these cases proved of a more aggravated type than any that had occurred during the year.

"Having procured a supply of solution of chloride of zinc in October last, its employment in the holds and pump-well has, I need not add, completely succeeded in destroying the disgusting fœtor formerly complained of. But what I consider most worthy of remark is, the extraordinary fact, that since the use of this agent fever has also disappeared; not a single case of that disease having occurred even among the persons above mentioned, who were formerly so obnoxious to it."

M.H.S. "Resistance," Gibraltar, June 2, 1848.

SIR,

Her Majesty's ship "Resistance" having been employed in the conveyance of troops during the last eighteen months, has afforded me many opportunities of testing the influence of the solution of chloride of zinc as a sanitary agent.

I may preface my remark by stating that on more than one occasion there have been upwards of 800 persons on board, and that the women's room, from being situated in the after part of the lower deck, and extending the whole length of the former gun-room, is, even under the most favourable circumstances, exceedingly close, but in bad weather, when the stern-ports have to be kept shut, the noxious effluvia are then intolerable. On visiting this apartment in the morning, accompanied by Dr. Robertson, surgeon of the 1st battalion 44th Regiment, shortly after the battalion embarked at Cork, in April, for a passage to Malta, such a vitiated atmosphere existed as to render the apartment unfit for occupation: however, after the application of the dilute solution, all unpleasant effluvia disappeared. It is also to be remarked, that this apartment was unoccupied throughout the day, (except at meal hours,) and a free current of air established through it by a windsail when the weather admitted, and in addition, the utmost attention to cleanliness was evinced daily by those who had charge of keeping it clean, yet the unpleasant effluvia could not be removed until the dilute solution had been copiously sprinkled over the deck.

Having embarked the 1st battalion of the 5th Fusiliers at Plymouth, in July, 1847, for conveyance to the Mauritius, ample opportunities of testing the utility of the chloride of zinc solution were, during a three months' passage, afforded to Dr. McKenzie, surgeon of the regiment, particularly off the Cape, where we experienced very bad weather. We both considered it a powerful disinfecting agent. He also used the dilute solution, as an application to indolent sores, with considerable success. His report I had the honour to transmit on our arrival in England in March.

On our recent passage to Malta I had a very severe case of erysipelas of the face, and, from the crowded state of the ship, was apprehensive of the disease spreading. To prevent such an untoward event, the following precautionary measures were adopted—viz., enclosing the patient in a screened berth, with blankets kept damp by the dilute solution, and the result was most satisfactory.

I have used the solution, in the proportion of 1 to 4 parts of water, as a lotion in tinea, with complete success, the patient being a delicate boy of strumous habit. I have also used it as an application to a sloughing sore on the thumb, attended with disease of the bone, the discharge being exceedingly fetid, and found it very useful, both in detaching the slough, and in destroying the fætor.

Enclosed herewith, is a Report from Dr. Robertson, surgeon of the 1st battalion 44th Regiment.

I have, &c.

(Signed) JOHN H. HAIRE, Surgeon.

Sir W. Burnett, K.C.H.  
&c. &c. &c.

ENCLOSURE.

H.M.S. "Resistance," Gibraltar, May 6, 1848.

SIR,

I have great pleasure in being able to give my testimony to the powerful disinfecting qualities of the solution of chloride of zinc, and as to its efficacy in removing noxious effluvia. While on board Her Majesty's ship "Resistance," I have frequently used it in the cabin appropriated for the women and children of the 44th Regiment, which, in consequence of its crowded state, and the unavoidable confinement attendant on very bad weather experienced for a week after leaving Cork, was rendered so foul as to make the duty of those who had to keep it clean perfectly irksome: however, an hour after the first application, all disagreeable odour disappeared, and using it daily, subsequently, the cabin retained its purity.

I have, &c.

(Signed) R. F. ROBERTSON, M.D., Surgeon, 44th Regiment.



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"Unite," Convict Ship, Woolwich, November 30, 1848.

SIR,

The cholera having happily ceased, we feel it our duty to bring to your notice the advantages resulting from the use of the chloride of zinc, as a destroyer of all foetid exhalations, and as one of the most powerful disinfectants with which we are acquainted. We used the solution in the "Warrior" and the "Justitia" with good effect, but it was in the hospital-ship where we had the best opportunity of practically testing its great utility. This ship is remarkably well ventilated, and the chloride of lime has always been used; we therefore directed its discontinuance, and in its place used the zinc; we consider the advantages of the latter to be great and incontestible: it destroys all offensive effluvia more perfectly than the former, leaving the atmosphere around free from all unpleasant smell, while the chlorine from the lime is to many peculiarly offensive. One patient, labouring under abscess of the lungs, was so offensive, as to be scarcely approachable; the solution removed all odour, and so contributed to the patient's comfort, that he requested to be allowed to use it as a gargle, and to wash the surface of the body with it. He declared that he found great relief from its use.

The patients were allowed to have either the lime or the zinc, as they liked, to sprinkle the bedding and place in the close stools, but they invariably preferred the zinc, stating that the odour of the lime was offensive, but the zinc had no unpleasant smell.

So strong is our opinion of its utility as a deodorizing agent, that we shall never cease to use it on all occasions when an agent of that kind is required, and we recommend most strongly its general adoption in every department of the Convict Establishment. In the Naval Service it is properly appreciated. To the Mercantile Marine it would be invaluable; for when offensive smells arise from a hold which cannot be cleansed, the free use of the solution would remove all these, and at the same time preserve the woodwork of the ship, which we believe to be always undergoing decomposition, when noxious effluvia are evolved.

We are, &c.

(Signed)

G. H. DABBS, *Surgeon, R.N., Medical Superintendent,*  
*Woolwich Convict Establishment.*

EDWARD NOLLOTH, *Surgeon, R.N.*

FREDK. M. RAYNER, *Assistant-Surgeon, R.N.*

H. P. Voules, Esq., Superintendent of Convicts.

H.M.S. "Crescent," Rio de Janeiro, September 1, 1848.

SIR,

With reference to your letter of the 29th December last, respecting the solution of the chloride of zinc as a disinfecting agent in disease, and a purifier of foul air, I beg to inform you that I have not had an opportunity, since the receipt of your letter, of testing its virtues as a disinfectant. I remember about eighteen months ago, when we had African small-pox on board, your solution was used freely, the persons and bedding of the sick were sprinkled, and the deck frequently mopped with it; and it certainly was matter of remark at the time, that the persons attacked had the disease in a much milder degree.

I have, &c.,

(Signed) J. ELLIS, *Surgeon.*

Sir W. Burnett, K.C.H.,  
&c. &c. &c.

H.M.S. "Daphne," Madeira, January 3, 1849.

SIR,

An opportunity of testing the solution of chloride of zinc as a disinfecting agent, having presented itself, I have the honour to submit the result to your notice. Soon after leaving Plymouth Sound, phlegmonous erysipelas attacked eight men in quick succession, all belonging to the three foremost messes on the port side of the deck. The disease was distinctly traceable to the wife of one of the men in the first mess, who came round in the ship from Sheerness to Plymouth. It was evident the morbid influence was confined to this spot, as men further aft had common phlegmonous inflammation only; whereas, in those coming from this part, it put on an erysipelatous

character. The solution was used in the manner, and proportion, directed in the Circular. After its third application, no new case occurred there; but a solitary one occurred on the 23rd ultimo, on the other side of the deck, since which there has been no new case; and I consider the disease completely subdued.

If the cessation of the disease can be attributed to any external agent, it is reasonable to suppose it must be to the use of the solution, for the weather being most severe, prevented, in a great measure, free ventilation, or the adoption of other means for purifying the deck.

I have, &c.  
(Signed) JAMES GEORGE RISK, Surgeon.

*Extract from the Nosological Return of Dr. Niddrie, Surgeon of H.M.S. "Asia," between 1st April and 3rd June, 1848.*

"During the previous quarter, cases of erysipelas had occurred, and slight sores had taken on an inflammatory character, and early in April a bad form of synocous appeared in the ship. It began with rigors, general pains, headache, vertigo, and early in the disease there was determination of blood to the head: erysipelas frequently supervened; in many cases, erythematous inflammation passed over the extremities, and a large part of the trunk. Chloride of zinc had been frequently sprinkled about; but on the 7th May, the limbers in the fore-hold, and in the spirit-room, were taken up, to allow large quantities of the fluid to pass along the bottom of the ship. This, with additional ventilation, appears to have had much influence; for in a few days, the attacks became less frequent, and the cases comparatively light."

*Extract of a Letter from J. W. Johnston, Esq., dated on board the "Barretto Junior," Spithead, November 15th, 1847.*

"During my stay at this port, I have visited Haslar, and have carefully examined the erysipelatous cases that have been treated by the application of the lotio chloridi zinci: it appears to be a most efficacious method of treatment, and, to me, seems to possess at one and the same time a double advantage, in cases such as erysipelas during its application, the evaporation which takes place, acting as a disinfecting agent."

*Extract of a Letter from J. W. Johnston, Esq., M.D., Deputy-Inspector of Fleets and Hospitals.*

"On my passage to Bermuda, an opportunity occurred on board the 'Barretto Junior' transport of testing the disinfecting properties of the chloride of zinc. During the voyage, several febrile cases occurred amongst the troops; all were mild, with one exception, which proved to be a most malignant case of typhus, exhibiting towards its termination petchiæ, with hæmorrhage from the gums and palate. You may imagine the consternation and alarm it caused on board, and more particularly when it was found to be impossible to remove the fever case from the main deck, no other place on board being available.

"On the same deck with the fever case, were berthed 131 men, 4 females, and 6 children, and at times the hatchways were obliged to be closed in consequence of the seas breaking in-board. I recommended the patient to be placed abreast of the after-hatchway, so as to be separated as much as possible from the others, a blanket screen to be placed around him, and to be kept constantly wet with a solution of the chloride of zinc; this was continued for six days.

"Dr. McIntosh, of the 24th, and Assistant-Surgeons Power and Cotton, R.N., are of opinion with myself, that to its agency alone we owed our preservation from an extension of fever."



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*Copies of Letters respecting Erysipelas, and the employment of the Solution of Chloride of Zinc, for purifying the Wards of the Royal Marine Infirmary at, Woolwich.*

Royal Marine Infirmary, Woolwich, 19th September, 1847.

SIR,

In consequence of the number of cases of erysipelas which have occurred within the walls of this establishment, from the 3rd July last, the date on which I took charge, I consider it my duty to lay before you the following statement. I beg also to enclose a list of the patients attacked with erysipelas, &c., the disease for which they were originally received into hospital.

On joining the division on the 13th July last, there were two men in hospital under treatment for phlegmonoid erysipelas, and I found on inquiry that it was a disease of frequent occurrence within the walls, or in other words, occurring as a secondary affection, and that patients were seldom received into hospital labouring under the complaint. Since the above-mentioned date, no less than 17 men have been attacked with the disease, in all its variety of form and in different degrees of severity; most of them when attacked were under cure for syphilitic affection, and had open buboes; others were medical cases which had required the application of blisters, sinapisms, or the cupping scarificators; but it seems of little consequence from what cause the individual is suffering, as all that is required to render the patient liable to an attack of erysipelas, within the walls of this hospital, is a slight wound or abrasion of the surface of any sort. The most distressing case which has yet occurred is that of Mr. Tallis, who was admitted 30th July last, per order of the Admiralty, and who was in No. 10 ward entirely by himself; he came into hospital in consequence of disease of the shaft of the thigh bone; he appeared to be doing well, and his general health was much improved, when on the 6th instant he was seized with erysipelatos inflammation of the sore situated about the middle of his left thigh. The attack proved most severe: the inflammation which first spread upwards above the groin, as now found its way downwards to the feet; his sufferings have been, and still are, great, and being attended by excessive constitutional derangement, which, operating on a system already much reduced by the primary affection and three years' service on the coast of Africa, has left him now in such a state of prostration as to render his recovery extremely doubtful.

I beg to assure you that every means within our reach have been most assiduously had recourse to, not only in the treatment of our patients here, but for the prevention of the increase of so formidable and intractable a disease; I regret, however, to say, without any appearance of diminished numbers, or mitigation of the symptoms of those attacked.

I have the honour to be, Sir,

Your most obedient Servant,

(Signed) JOHN DRUMMOND,  
*Deputy Inspector of  
Hospitals and Fleets.*

Sir W. Burnett, K.C.H., F.R.S., Director-General  
Medical Department of the Navy.

Admiralty, September 22, 1847.

DEAR SIR,

I regret to hear that so many of the patients under your care have been attacked by erysipelas, and desire you will inform me, whether men labouring under this disease have been kept in the wards even for a day with other men who had clean sores, and I wish you would more clearly trace the origin and course of the malady, and state the same fully to me.

If you have not already done so, you will be pleased to appropriate a well-ventilated ward or wards in which to place the erysipelatos patients, and cut off all communication, either by patients or nurses, with other parts of the hospital; direct all the bed and body linen used to be put into a diluted solution of the chloride of zinc, viz. one pint to twenty gallons of water, and allow the articles to remain in it all night, and then let them be well washed in warm water. Pieces of blanket may be immersed in a stronger solution, and hung up before the open windows, and in cases of sloughing, the solution may be applied to the sore.

The cradles and floor should be sprinkled, or mopped with the solution. Take care not to crowd your patients in the wards, half the usual number is enough; and let every man have his own sponge, which, when the sores become clean, should be burned, and another supplied.

You must be so well acquainted with the general principles of treatment, that it is not necessary I should say any thing on the subject, but I shall be glad if you will report frequently the farther progress of the disease.

I remain, dear Sir, faithfully yours,  
(Signed) W. BURNETT.

To J. Drummond Esq., Deputy Inspector,  
Woolwich Infirmary.

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Royal Marine Infirmary, September 27, 1847.

DEAR SIR,

Since I wrote to you on Saturday, I am glad to say we have had no new erysipelatous cases, and all those in hospital are convalescing as well as we could wish. One circumstance is worth mentioning, *i. e.*, all the open sores which were affected have put on a much better and more healing appearance than before the attack.

Our number in hospital remain, but with the exception of a fractured thigh from the Dock-yard, we have nothing of any consequence. The number was 82 at this morning's visit.

I remain, &c.  
(Signed) JOHN DRUMMOND.

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*Extract from the Nosological Return for Lady-Day Quarter 1848, of John Drummond, Esq., Deputy-Inspector of Woolwich Infirmary.*

"At the close of the quarter I had to remark upon the decrease of erysipelatous cases, and on the comparative mildness of those which did occur, but not many days after the transmission of that report, two cases were brought into hospital, and both terminated fatally. It is of consequence, however, to remark that the patients came *with* the disease, and also that they both belonged to Her Majesty's ship in ordinary the 'Nymph,' on board which it was found that the disease had prevailed to some extent. With two exceptions, of no great severity, the foregoing constitute all the instances which have occurred during the last three months of this most intractable disease.

"I need scarcely remark that the usual precautions were taken to prevent the spreading of the disease throughout the other wards, and in this instance we were more fortunate than on former occasions.

"The means had recourse to consisted of isolating erysipelatous cases from the others in hospital. Free ventilation, good fires, and extensive evaporating surfaces of the solution of chloride of zinc. This last-mentioned prophylactic was used to a greater extent than usual throughout the hospital; and, independent of its deodorizing qualities, I am inclined to believe in its disinfecting virtues. Certain it is that on no former occasion was it used so freely, and on no occasion have I ever known disease to exist within the walls of this building without its being communicated to others, more particularly to those patients affected with open bubo, an affection of which there were many in hospital, and one which has also shewn itself so susceptible of erysipelas. I may also remark, in reference to this remedy, that I have lately found it, in many respects, a speedier remedy for psora than sulphur, and quite as certain a cure. I have also used it in foul and indolent ulcers, and found it to answer well."

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*Dr. Allan to Sir William Burnett.*

Haslar Hospital, October 7, 1847.

I beg to enclose you a copy of the report of the 30th September ult. on the chloride of zinc, and further to acquaint you that I have had four cases of erysipelas from the Marine Barracks since, in which I have used it externally as a wash with



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considerable advantage, *tepid*. The fever has not been so intense as I have generally noticed in previous cases, and the course of the disease has not been so long. In a case admitted on the 27th ult., I used the nitrate of silver externally, with purgatives; it is in the same ward with the cases under treatment with the zinc lotion and purgatives. The disease is still intense, and no desquamation has taken place; whereas the other cases are convalescent. I have submitted them to the observation of Sir John Richardson to-day, as I am anxious to have the trial as open as possible. It must not be used cold in cases where the scalp is the site of the disease. In one case it produced alarming symptoms of cerebral congestion. The patient had previously complained of its "drawing up his skin;" and I had ordered it to be discontinued for a time. It was again ordered *tepid*; but the nurse used it cold during the night, which brought on a state of coma, which lasted for twenty-four hours.

The cases have all been brought into hospital from the Marine Barracks and ships, and I can therefore say nothing as to its disinfecting powers,—a fact which must take some time and careful observation to establish, but to which I will give my utmost care and attention.

I have commenced its use in the form of baths in skin diseases; but I have not had sufficient experience to be able to make a report on it.

Your obedient servant,  
(Signed) JAMES ALLAN.

*From Rear-Admiral Sir T. Ussher, with Enclosures.*

Admiralty House, December 17.

MY DEAR SIR WILLIAM,

I have great satisfaction in forwarding to you reports of trials made of your inestimable discovery of the chloride of zinc.

Lieutenant Friend, who is the Emigrant Agent at this port, having informed me, soon after taking the command of this station, that he had received most heart-rending accounts from the Captains of emigrant ships who had sailed from this place to Canada with settlers, in fact, stating that fever during the voyage in some instances had carried off one-third of their number; and as he was just then sending out three vessels to America, full of these wretched people, many of whom were no doubt affected by the prevailing fever of this place, the hospitals being full, it struck me, from Dr. Lindsay's able report on the disinfecting power of the chloride, to order some to be sent to each of the ships; and I have only now been able to forward to you the result, which requires no comment from me. It must be some gratification to you to have had it so well tested; in my opinion, no vessel ought to go on a voyage without it; I am quite sure the Americans will adopt it in preference to the chloride of lime.

I find Cork a damp climate; it has affected both my health and my old wounds, which you may recollect I suffered from when we were in the Mediterranean some years back; however, these things must be borne with. I hope your family are all well, to whom present my best compliments. I am, &c.

To Sir W. Burnett, K.C.H.,  
Director-General of H.M. Navy.

(Signed) T. USSHER.

## ENCLOSURE 1.

Cove, Cork, December 13, 1847.

SIR,

I regret my many occupations at Quebec prevented me acquainting you, as you requested, with the state of health on board the "Albion," under my command, during the voyage from Cork to North America, with emigrants, in August last. With reference to the use and effect of the chloride of zinc, so kindly supplied by the directions of Sir Thomas Ussher: shortly after leaving Cork, two cases of fever occurred, but both speedily gave way to the simple medicines with which I was amply provided, and subsequently nine more cases occurred with the same results; I reached Quebec, however, with my passengers in good health, the fever in each case not extending beyond the persons attacked.

I lost two aged persons on the voyage, and two infants, from bowel complaint, which aged and very young persons are liable to from change of diet. The chloride of zinc was used daily, and occasionally twice a day; and the air between decks was obviously sweetened by its use. I was amply provided also with chloride of lime, but I did not use it, as you wished the chloride of zinc to be used.

Charles Friend, Esq., Emigration Officer, Cove.

(Signed) CHARLES DALY.

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ENCLOSURE 2.

Government Emigration Office, Cove, December 16, 1847-

SIR,

I have the honour to enclose a report from the master of the "Albion," on the state of health on board that vessel during the voyage to Quebec, in August last, and on the use of the chloride of zinc, which you so kindly had directed her to be supplied with, and which I think is a powerful testimony in its favour. I have not yet received any report from the masters of the "St. Lawrence," and "Henrietta Mary," which were also supplied; but I learn from the owners of the first that she arrived at St. John's, New Brunswick, *without the loss of a single passenger*, or any illness on board. The "Henrietta Mary," I understand, lost several of her passengers on the voyage, and landed some sick at Grosse Island; but I am informed that the chloride was not regularly used in this vessel during the voyage

(Signed) CHARLES FRIEND, R.N.,  
Emigration Officer.

Sir Thomas Ussher, K.C.B.,  
&c. &c.

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*Extract from Dr. Rae's Quarterly Return of the Sick in the Royal Marine Infirmary, Chatham.*

In my last note I informed you of the prevalence of low fever; and although the cases have lately been less numerous, they have become more malignant—indeed, I do not think they could have been worse in Ireland than some of those now in the hospital. No doubt the disease was brought here by the Irish recruits, to which class it has chiefly been confined. I am happy to say, however, that we have had few deaths, considering all things; and as the weather is now cool and settled, I hope we shall soon get quit of it altogether. As a disinfectant, the chloride has acted beneficially; not one case has occurred beyond wards No. 9 and 10, wherein the men were confined, and the air is so pure and wholesome, that no stranger entering the wards could ever suppose they were in the presence of typhoid patients; neither is there the least foetid odour or emanation to be discovered. The patients invariably have been sponged with it two or three times daily, particularly when exacerbations took place; their mouths and teeth have been cleaned from sordes with it; and they have always felt refreshed from the operation.

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*Letter from H. Waddington, Esq., to Captain Hamilton, R.N.*

Whitehall, February 8, 1850.

SIR,

I am directed by Secretary Sir George Grey to acknowledge the receipt of your letter of the 4th instant, transmitting, by desire of the Board of Admiralty, the copy of a Memorandum from the Medical Director-General of the Navy, and also of a Report from the Surgeon-Superintendent of the convict ship "Pestonjee Bomanjee," stating the beneficial effects resulting from the solution of the chloride of zinc as a disinfectant agent, on board that vessel during the passage to Bermuda.

I am, &c.

(Signed) H. WADDINGTON.

Captain Hamilton, R.N.,  
&c. &c. &c.



*Influence as a Sanitary Agent.*

*Letter from Mr. T. H. Keown, Surgeon-Superintendent of the "Pestonjee Bomanjee," referred to in the preceding.*

"Pestonjee Bomanjee," Bermuda, 15th Dec., 1849.

SIR,

I have the honor to report to you on the effects of the solution of the chloride of zinc as used on board this ship. In compliance with the Admiralty Circular of 7th July, the limber boards were taken up and the hold fully washed with 100 gallons of the diluted solution (1 part to 20), previous to the shingle ballast being shipped. On the 30th September the guard was embarked at Deptford. As the cholera was prevalent in all parts of England at the time, and almost every convict and emigrant ship that left England previous to this was visited by that fearful malady, I determined to avail myself of the well-established influence of the chloride of zinc in destroying the noxious effluvia of bilge water, and the various morbid agents on board a crowded ship. This I did with full confidence, from previous experience of its effects; and I was glad to find that the present larger supply enabled me to do justice to its reputation.

On the passage to Cork, which was boisterous, wet, and tedious, the soldiers' and sailors' quarters were daily sprinkled with it. Seven days after our arrival at Queens-town, the ship was pumped out, and 50 gallons passed down the air-holes, and a portion sprinkled on the ballast. On the 22nd and 23rd October, 301 convicts were embarked; and on the 30th, 100 gallons were passed down the pumps, and retained for several days. November 2nd we sailed for Bermuda. On the 21st, 62 gallons were again passed down the pumps, and the ballast sprinkled freely; this, like the last, was retained for a week. The water-closets were every second day washed with the diluted solution, and occasionally the prison deck sprinkled with it. On the 10th December we arrived at Bermuda, and on the 13th the guard and prisoners were landed. The results have been most gratifying, for not a single sick man was sent on shore, either of the guard or prisoners, and to their healthy appearance the Governor's certificate will testify.

During the voyage I have had no sickness, except sea-sickness, and the usual effects of a sea diet; indeed, for the first time, I find it necessary to return a blank Medical Journal. I am disposed to attribute these happy results to the influence of the chloride of zinc, for I suppose the sanitary regulations in other respects have been much the same as on board other convict ships. I think the best method of applying it to the ship's hold is to pump her out dry, and pass at least 100 gallons down the air-holes and pumps, and allow it to remain until it is necessary to pump her out again. Before proceeding to sea, I would recommend this to be done, so that the ship's motion should diffuse it over the hold. I would further suggest that the management of this should not be left to the ship's company, who are at a loss to understand why one should take so much interest in the use of a fluid without odour, and so silent in its action.

The smell of bilge-water was unknown on board the "Pestonjee Bomanjee," and thus one prolific source of disease was removed; indeed I have never been in a ship so sweet and free from offensive effluvia.

I am, &c.

(Signed) T. H. KEOWN, Surgeon, R.N.

Sir Wm. Burnett, K.C.H.  
&c. &c. &c.

*Extract a letter from Dr. R. A. Bankier, Surgeon of the Hospital Ship  
"Alligator," dated 1st September, 1849.*

"Alligator," Hong Kong, September 1, 1849.

"I would here state that I have not had sufficient opportunity of testing the destroying or influencing powers the solution may possess over the causes of infectious or contagious diseases, to enable me to say anything definite on the subject; but the almost daily use of the agent in this establishment, during the space of nearly three years, has elicited facts enough to lead me to believe that this chloride is of great value in numerous ways in an hospital, and that it may be made not only highly conducive to the recovery of sick persons, but be preventive of disease among those

in health, by its power in destroying the effluvia given off from diseased animal excretions, and other sources.

"The benefit alluded to I have especially seen to accrue in the treatment of the formidable cases of dysentery often here occurring, and the destroying power spoken of is well exemplified in the history of the two hospital ships 'Minden,' and 'Alligator,' in this anchorage, during the four last years. In the former ship, under the use of chloride of lime, and the assiduous employment of commonly used means, backed by 'Reid's ventilating apparatus,' the hospital deck could not be kept well free from offensive smells in summer, when dysenteric cases were under treatment, and visitors not unfrequently complained of discovering the existence of such smells even on the upper deck; whereas, in the latter ship, where the solution of the chloride of zinc has been employed, as above said, for the space of nearly three years, I have only once heard a complaint, of the nature mentioned, and that was when, for a short time, the supply of the fluid was exhausted. The facility with which the solution can be applied is, I would express, not the least recommend ation in its favour."

I have, &c.

(Signed) R. AUSTIN BANKIER, Surgeon.

Sir Wm. Burnett, K.C.H.  
&c. &c. &c.

*Extract from the Nosological Return of Mr. Wm. McCrea, Surgeon of H.M. Steam Frigate, "Centaur," between 1st April and 30th June, 1849.*

"After the ship arrived at Ascension, the fever which made such a conspicuous figure in the last Nosological return declined; four more cases were added to the list, but were very amenable to treatment; the ship having been cleared of the accumulated filth that was found in her holds, was thoroughly saturated with the solution of chloride of zinc, which perfectly eradicated the products of decomposition, to which I attribute the fever that prevailed."

*Letter from Mr. R. T. C. Scott, Surgeon of H.M.S. "Hastings," dated 2nd July, 1850.*

H.M.S. "Hastings," Singapore, July 2, 1850.

Sir,

I beg to submit to you a copy of a letter which I have received from Dr. Burtt, Acting Surgeon of the United States sloop "Preble," to whom, with the sanction of the late Rear Admiral Sir F. A. Collier, I supplied some of the solution of the chloride of zinc, expressive of his opinion of its properties on further experience, and detailing the advantages that were derived from its use during the disastrous voyage of his ship from China to the Sandwich Islands. I say "on further experience," because I already had the honor to lay before you a report from the same officer on the excellent effects of the solution, a small quantity of which I had previously supplied him with under similar authority.

I have, &c.

(Signed) R. T. C. SCOTT.

Sir Wm. Burnett, K.C.H.  
&c. &c. &c.

ENCLOSURE.

United States Ship, "Preble,"  
San Francisco, January 2, 1850.

DEAR SIR,

After our return from Japan, we were preparing to start for the United States, when orders arrived from home for us to proceed to California. Our men were then allowed leave at Macao, much against my wishes, and in a few days afterwards, dysentery of a very fatal form manifested itself. We were ordered to sea immediately, sailing with 35 cases upon the list, and having experienced continuous exceedingly bad weather, it soon averaged 54 daily. This state of affairs con-



*Influence as a Sanitary Agent.*

tinued from about the 1st of June to the 21st of August, when we arrived at Honolulu, Sandwich Islands, having been directed to proceed there to form a hospital on shore. We lost 23 men at sea, and five in port, and took our departure from Honolulu, for this place, on the 10th ult., leaving 32 invalids behind us. You may, perhaps, imagine the condition of our small berth deck during a continuance of stormy weather, with an average of 49 cases of dysentery. The scene was awful;—the stench from the persons of the dying and dead—the discharges of the sick, and the moisture almost insupportable. To destroy this odour, I used the solution of chloride of zinc, so kindly furnished by you, and I subjoin an extract from an official report to our Navy Department, made by me thereon, which, if of any use to you, is at your service. "I would embrace this opportunity, however, of directing attention to Sir William Burnett's solution of 'Chloride of Zinc,' as a disinfecting and antiseptic agent. Several bottles of the concentrated solution were given to me for experiment by Mr. R. T. C. Scott, surgeon of Her Britannic Majesty's Ship 'Hastings,' the flag ship on the East India and China Station. I embraced the opportunities presented by the occurrence of variola on board, and of the present epidemic, as well as those occasioned by offensive smells from the hold, round-houses, head, &c., to test its properties, and found that without any odour of its own, it almost immediately destroyed those that had been exceedingly noisome. With this property, and its known power of correcting deteriorated provisions, I am inclined to believe that if there be such a thing as a disinfecting agent, this article will prove as effectual, cheap, and convenient, as any that has yet been discovered. The bottles given to me contained thirty ounces each, to be diluted for the purposes mentioned by sixty parts of water, forming a convenient article for ships' use."

I have given you the above extract, hoping that it may reach you some time or other, though I do not know how to address it in such a manner as to ensure its arrival at its destination. I should like much to hear from you, and should you feel disposed at any time to occupy a few moments in writing to me, address to the care of the United States Navy Department.

(Signed)

JNO. L. BURT, M.D.,  
Acting Surgeon, U.S.N., U.S.S. "Preble."

Mr. R. T. C. Scott, Surgeon, H.B.M.N.

*Letter from Mr. John Gallagher, Surgeon H.M.S. "Arab," dated 6th December, 1849.*

Shanghai, China, December 6, 1849.

SIR,

In accordance with a circular received some time ago, I have the honour to report that I have experienced the most invaluable benefit from the use of the solution of chloride of zinc, during the late severe attack of fever and dysentery with which this vessel has unfortunately been visited.

In the dysenteric cases, when the discharges were of the most fetid and offensive odour, and when it was occasionally necessary to keep them for a short time (as it was only by a frequent inspection of the evacuations, the progress of the case could be ascertained) by pouring a small quantity of the dilute solution in each vessel, sprinkling the decks liberally, and occasionally the patients' bed clothes, the bad smells were almost completely prevented, and a feeling of freshness in the air was often experienced after such application; in this way, it must prove a powerful adjunct in the treatment of such diseases. Without its aid, I don't know what we should have done on a late occasion; we were at anchor for a week during a gale of wind, in the Yangtze-Kiang, the hatchways covered over, there being a heavy sea at the time, and we had some cases of chronic dysentery confined to their hammocks on the lower deck. If by any neglect, the use of the solution was forgotten on requiring the bed-pan, the smell became so intolerable that it was impossible to remain on the lower deck, while by taking the precaution of putting a little of the solution in the bed-pan previously, the bad smell was almost completely prevented. It is only on such occasions its real value as a deodorizer can be sufficiently appreciated.

As a disinfectant I cannot speak so positively, but it certainly seemed to have exerted some modifying influence in preventing the spread of contagion in the following case. In last March, we were at anchor in the Canton River, small-pox was then very prevalent in the neighbouring villages. Although little communication was had with

the shore, by some means the virus was introduced on board, and one case appeared; as soon as its real nature was ascertained, the patient was removed from the ship to a boat anchored some distance off; the decks and beams were washed with a solution of chloride of zinc, and no case appeared after. We were ordered to leave the river before complete desquamation of the cuticle took place in the man attacked, and as there was no place to send him to, we took him on board, adopting the precaution of making him sleep on deck, immersing his clothes in a weak solution, and drying them before wearing, and washing the body frequently till the skin became smooth and free from scurf. Although this man had a severe attack of confluent small-pox, when the virus must have been very virulent, if it ever varies in mild and severe cases. No other case appeared afterwards.

Sir Wm. Barnett, K.C.H.  
&c. &c. &c.

I am, &c.,  
(Signed) M. GALLAGHER, Surgeon.

*Extracts from the Nosological Returns of Dr. Wm. Ross, Assistant-Surgeon of H.M.S. "Peterel," between 1st October and 31st December, 1849; and 1st January and 31st March, 1850.*

*(From Return between 1st October and 31st Decembee, 1849.)*

"To prevent the disease (yellow fever) from spreading, the solution of the chloride of zinc was used, in the proportion of 1 to 40 of water. The fluid has been kept sprinkled over the lower deck, the cabins, and the after-part of the vessel. As directed in the printed form, pieces of flannel saturated with it, have been kept constantly during the day, suspended from the beams. It was sprinkled over the bed-clothes of the sick, and over the dresses of the attendants; and its effect in destroying the offensive smell arising from the stools at first passed by the patients, was almost instantaneous. I have never seen yellow fever before, but I am convinced the two first cases alluded to were of a most malignant nature, and the fact of the disease not having spread further, affords, I think, good evidence of the great utility of the solution of chloride of zinc as a disinfecting agent, and a destroyer of the deleterious miasma, or whatever may be the causes of the disease. A large quantity of it has been used, but I trust, the peculiar circumstances of the case, will fully account for the unusual expenditure."

*(From the Return between 1st January and 23rd March, 1850.)*

"The solution of the chloride of zinc was continued to be used for several days, and the disease entirely disappeared in the manner stated in the last Return."



## ON THE TREATMENT OF ULCERS BY THE SOLUTION OF CHLORIDE OF ZINC.

THE solution of the chloride of zinc has now for some years been pretty extensively used in the treatment of ulcerative diseases, and in most cases with decided benefit. In its action it appears in some degree to combine the advantages obtained, or sought to be obtained, from the application of poultices and evaporating lotions. Small indolent skin-deep sores, with a thin lymph-like discharge, rapidly improve under its use. In these cases it ought to be employed in the same manner as an evaporating lotion. The sores, in the course of a day or two from its first application, will generally begin to assume a much more healthy appearance,—the pale, flabby, indistinctly granulated surface, covered with a glairy discharge, will give place to a crop of healthy granulations, which rapidly fill up the cavity in the skin, and at length produce a firm healthy cicatrix. The lotion that appears to have answered best in these cases, is one made from one part of the concentrated solution to 40, or 50 parts of pure water.

The peculiar effects of the solution have been, however, much more remarkable when employed in the same manner to sloughing ulcer, a disease which has perhaps disabled more men in the British Navy, than the shot of the enemy. The lotion in these cases will require to be made rather stronger, so that it may stimulate the sore, and at the same time act slightly as an escharotic. The sloughs will thus be speedily detached, while any morbid fungous-like growths that may have sprung up, are destroyed, leaving a clean healthy suppurating surface exposed to view. If the sloughs do not come away as soon as could be wished, or if much pain be produced by the lotion, a bread poultice, three or four times applied, for a day or two, will remove the one and relieve the other. A weak solution of the chloride should be sprinkled over the poultice before it is applied.

But there is another great advantage attending the application of the solution to extensive sores, which requires to be stated, namely, the power which it has over the effluvium, or rather the stench, which invariably accompanies sloughing ulcers, and which, at times, proves so distressing to the patient, and to his attendant, as to render life itself almost intolerable to the one, and the discharge of a most sacred duty a task of insuperable difficulty to the other. Dr. Allan, of Haslar, has stated that he was in the habit of soaking the lint applied to ulcers in a lotion made from one drachm of the concentrated solution to about a pint of water, with decided good effect; it not only made the air of the wards more agreeable, but by accelerating the separation of the dead parts, it changed the character of the ulcers. Still, great as may be the advantages gained by the application of the solution to single cases of ulcerative disease, they are unquestionably much greater and much more appreciable when it is applied for the prevention and

cure of that disease, when it has acquired infectious properties, as frequently happens in ships and in hospitals. It is under these circumstances that its deodorizing powers are to be chiefly prized; for by preventing the emanation of putrid effluvia from foul bandages, from sloughs, and the offensive matter discharged from the sores, it preserves the atmosphere of the ship, hospital, or house, as the case may be, free from taint; and thus prevents the disease from being communicated to other healthy persons, or to patients suffering from wounds, injuries, or other diseases. It is under these and similar conditions that the solution more especially comes under the denomination of a disinfectant.

In H.M. ships "Orestes," "Hibernia," and "Ganges," it appears to have most effectually put a stop to the ravages of this destructive malady. Dr. Muirhead, of the "Ganges," speaking of sloughing ulcer, observes that in "four of these cases extensive sloughing took place, giving rise to a most offensive factor, which tainted the air to the distance of eight or ten yards from the patient. This would have rendered him an insufferable nuisance, had it not been for the rapid efficacy of the solution of chloride of zinc in destroying the factor."

With respect to the strength of the lotion to be used in different kinds of ulcer, no particular instructions can be given. Generally, one part of the concentrated solution to 40, 50, or 60 of water, will be found sufficient for a simple healthy sore; but for sores that are indolent, ill-conditioned, and possibly covered with adherent sloughs, one part of the former to about 30 or 40 of the latter, will be required. As a rule it might be well, particularly in irritable sores, to begin with a weak solution in the first instance, increasing its strength from time to time, until the desired effect was obtained. It has sometimes a better effect when applied tepid.

*Extract from the Medical Journal of Ch. W. Kevern, Esq.*

"From having witnessed the effects of the solution of the chloride of zinc on an indolent sloughing ulcer on board the 'Eurydice,' it has been frequently used in this ship in several conditions of that disease; namely, in small and superficial sores on the inferior extremities, which had commenced by tubercular eruptions in debilitated subjects, in whom the circulation of the vessels of the cuticle often required to be stimulated; a lotion of one part to five of water was satisfactorily employed. To promote the separation of the slough, in more extensive and less inflamed ulcers, a stronger lotion (by its caustic action) facilitated the process. In a patient, having an ulcer of this description over the centre of the tibia, and seven others of more recent formation, and smaller, distributed on the same leg, the solution was (unintentionally) applied undiluted, and inflammatory action produced. On this having subsided, by the use of fomentations, &c., it was found that the previously irritable and irregular appearance of the small ulcers had lessened and improved; the slough of the larger one being sooner detached than had at first promised; consequently its contraction and cicatrization was materially hastened."

*Extracts, &c., respecting the prevalence of sloughing ulcer, in H.M.S. "Orestes."*

"The 'Orestes' sailed from Gibraltar on the 16th February, 1849, and arrived in Simon's Bay on the 10th of April. In consequence of a representation from the surgeon, stating that boils and sloughing ulcers were prevalent among the crew, the commander-in-chief, Rear-Admiral Reynolds, directed that the captain of the 'Southampton,' and three medical officers, should proceed on board, for the purpose of inquiring into the state of health of the crew. These officers reported



*On the Treatment of Ulcers.*

that, having examined into the state of the berths, decks, holds, pump-well, &c., they were unable to detect any assignable cause for the sickness; but for the restoration of the health of the ship's company, they suggested as follows:—

1st. That the crew be removed from the vessel for as long a period as the service will admit of.

2nd. That the tanks be removed; the hold and store-room thoroughly cleared out, cleaned, and purified with a solution of the chloride of zinc: and that afterwards they should be well aired with stoves, white-washed, and kept open for a reasonable period.

On the 30th of June, Mr. Bernard, surgeon of the "Orestes," reports as follows:

"The disposition to sloughing ulcer, whether the sequence of boils, or slight wounds, continued until about the middle of May. Three bad cases were sent to the hospital at Simon's Bay, on the 10th of April, and five others, of a less malignant nature, but showing the same disposition to slough, were subsequently sent. In one of the three last cases the sloughing spread to a great extent while on shore; and it, with the three first cases, were left in the hospital on the ship's sailing to the Mozambique Channel. The sloughing in several instances was checked by the application of water-dressing and the solution of chloride of zinc. The latter, applied undiluted to the more recent cases, had frequently the effect of altering entirely the morbid disposition, and producing a healthy action; while, in the more advanced cases, diluted with forty parts of water, and applied tepid, it acted most beneficially as an antiseptic and sedative.

"In all these cases particular care was taken to keep them separate from each other, as well as separate from the rest of the ship's company. The chloride of zinc was freely used as a disinfectant;—the sponges and bandages were thoroughly soaked in it, after having been used, and then washed in hot water.

"The ship sailed for the Mozambique on the 16th of May; since which no cases of sloughing ulcer have made their appearance, and the men appear entirely restored to health. Fifty-six pounds of the zinc solution, diluted as directed, were used to purify the hold, bilges, &c."

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*Extract from the Medical Return of H.M.S. "Hibernia," between 1st October and 31st December 1848.*

Ulcers have been rare, and generally unimportant.

*Extract from the Return, between 1st January and 31st March, 1849.*

Ulcers, although the number has not been large, yet I regret that more than usual presented, of a sloughing character.

Single cases of this destructive disease have occurred at intervals since the month of November, 1848; but, in the beginning of March, three had assumed that action, and the appearance of two others was very threatening. Thorough cleanliness and ventilation having failed to check the occurrence of the disease, I recommended the application of the chloride of zinc in the manner prescribed by the instructions for its employment. One hundred and sixty pounds of the chloride of zinc was mixed with 400 gallons of fresh water, and poured into the air-holes and down the ship's pumps; the vessel was then canted to 7° each side, and the solution allowed to remain for forty-eight hours, after which it was pumped out clean; since then we have not had a fresh case of the disease, and although the course of those already attacked did not seem in the least degree altered, the two suspicious cases assumed a healthy action. The period, however, since the application of the solution, is as yet too short to arrive at any positive conclusion as to its influence over the specific cause of this most unmanageable disease.

*Extract from the Return, between 1st April and 12th June, 1849.*

At the date of my last return, I had to remark on the existence of ulcer, of a most violent sloughing character, in the ship, and detailed the steps taken for its remedy. I am happy to be able to inform you, that none of that character have since occurred, and that the ship has been perfectly clear of that most formidable disease.

*Extract from the Journal of Mr. John Tarn, Surgeon-Superintendent of the "Pestonjee Bomanjee," convict-ship.*

As an application to ulcers I can speak of it in very favourable terms, whether used as an escharotic, or in the diluted form; foul ulcers rapidly cleaned under its use, and in most cases the healing process was much accelerated. As a lotion, in cases of ringworm, I also found it of signal benefit.

*Extract from a Letter from Mr. J. W. Bradshaw, Assistant-Surgeon of H.M.S. "Royalist," dated Labuan, 1st May, 1849.*

I consider its valuable properties are not merely disinfecting; for I have made use of it as a stimulant in cases of indolent ulcers, and have found that when very considerably diluted, viz., one drachm to two pints of water, it forms an admirable stimulating wash for such ulcers, occurring in tropical climates, and which are, generally speaking, so slow of cure on board ship, on account of the want of proper vegetable regimen, as well as from the unhealthy and irritating discharges arising from them.

(Signed)

I have, &c.,

W. BRADSHAW, Assistant-Surgeon.

Sir W. Burnett, K.C.H.,  
&c. &c. &c.

*Extract from the Nosological Return of Dr. John Campbell, Surgeon of H.M. Sloop "Columbine."*

William Merchant, while exercising at general quarters, in the dark, at 8-30 p.m., on the 28th July, accidentally placed his right hand before the muzzle of a gun at the moment of firing, which caused total destruction of the hand; the radius and ulna being fractured in several places, and protruding through the integuments to such an extent as to render amputation at the upper third of the fore arm absolutely necessary. On the 23rd of March dressed the wound, part of which is uniting; the remainder exhibits a tendency to suppurate. 9 p.m.—Complains of acute pain in the arm, with headache, &c. 26th—Tongue cleaning; no headache; the flaps have separated, and are tense and swollen; discharge unhealthy and offensive; the bandage and lint to be kept constantly moist with a tepid solution of the chloride of zinc. 27th—Wound presents a most unfavourable appearance; in the afternoon complained of pain across the umbilical region; bowels relaxed: passed a large round worm. March 1st—An extensive slough covers the wound; the offensive smell from the discharge, which is profuse, is immediately removed by the chloride of zinc; nothing applied but lint and a loose bandage, wet with the solution, the stimulating effect of which, in addition to other advantages, materially assisting in the removal of the sloughs which separated on the 9th, leaving a clean healthy, granulating surface, with an inch of the radius and ulna projecting. 10th—Chloroform was again administered, and under its influence the muscles were detached from the bones, the ends of which were taken off sufficiently deep to allow a good covering to be formed over them.

*Letter from Dr. Traill.*

Singapore, September 11, 1849.

According to your wish, I forward to you my opinion of the chloride of zinc which you were good enough to forward me for trial. I found it beneficial in a bad case of phagedenic ulcer, the offensive effluvia of which it speedily and entirely removed. I made use of it as a gargle, and also as a lotion, in several cases of ulcer, one of them of a syphilitic nature. It was beneficial to all; but from my not having taken the precaution to dilute it sufficiently, its first effects were irritating, and apparently escharotic, and I have not since given it a fair trial in such cases. The only other use I have applied it to has been on the occasion of *post mortem* examinations at coroner's inquests, which, as you are aware, are of frequent occur-



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rence here. I have not found any other substance so effectual in correcting the putrid smell which is often so annoying on such occasions, and I have always found it successful even when chloride of lime was ineffectual.

(Signed) WILLIAM TRAILL, M.D.,  
*Madras Medical Establishment, in charge  
 of Civil Hospital, Singapore.*

R. T. C. Scott, Esq.,  
 Surgeon of H.M.S. "Hastings," Singapore.

*Report from James Allan, Esq., M.D.*

Royal Naval Hospital at Haslar, September 30, 1847.

Sir,

I beg to make a special report to you on the utility of the chloride of zinc, which has been extensively applied in the surgical department of this hospital for several months, more particularly in the erysipelas wards, in cases of sloughing ulcers, the result of that disease, and in which the smell was intolerable. I have been in the habit of wetting a blanket, and hanging it before an open window in each ward, that the air might pass through it, as also of soaking the lint applied to the ulcers in a solution, made in the proportion of one drachm of the chloride to a pound of water, with decided good effect, not only in making the air more agreeable to the patient, but in materially changing the nature of the ulcers, and accelerating the separation of dead parts. I have also used it as a wash to the surface of the body in cases of erysipelas, applied cold and tepid, and found it beneficial, except in one case, where the patient uniformly complained of its drawing the skin together (as he called it), although reduced in strength. It was not imagination, as I changed the form unknown to him. I have also used it as a lotion in syphilitic sores, in every stage of the disease, and found it beneficial, in the proportions of from half to one drachm to the pound of water, applied cold or tepid, according to circumstances.

It has a decided good effect in keeping down bad smells, if constantly used, more particularly when made tepid, and it makes a good injection in gonorrhœa, after the inflammation has been subdued. It is also an admirable escharotic, and is useful for general purposes of purification:

I have the honour to be, Sir, &c.

(Signed) JAMES ALLEN, *Deputy Inspector.*

Sir William Burnett, M.D., K.C.H.,  
 &c. &c. &c.

*Extract from a Letter from Mr. Richard King, Acting-Surgeon of H.M.S.  
 "Eurydice."*

"A patient presents himself with an irritable ulcer, situated on the lower extremity, assuming all the appearance and character of phagedæna, with a dark greenish slough, and a thin reddish discharge, which fastens the dressings; great pain in the surrounding parts, and a tendency to bleed on the slightest pressure or disturbance. Previous to using the chloride of zinc the ulcer should be well washed. The hair shaved off, and lint wet in water used freely for that day, together with the constitutional treatment generally adopted; the following morning a table-spoonful of flower is wet with the solution to form the consistency of paste which, is spread on a piece of lint, the exact size of the ulcer. This is applied, and should be kept on for four hours. On its removal a slough is produced, which by the use of water dressing (or if possible, a poultice, made of bread and lime-water), becomes detached in four or five days, leaving a healthy granulating surface, which rapidly fills up, and heals kindly in fifteen or twenty days. In some cases, where the constitution is very much debilitated, and the process gets on slowly; touching the part with a weak solution (half a drachm to two ounces of water every morning) will expedite the cure."

Letter from Dr. J. M. Miller, Surgeon of the Honorable East India Company's Steam-Ship "Nemesis," dated 10th June, 1849.

Singapore, 10th June, 1849.

SIR,

I have the honor to inform you that I made use of your solution of chloride of zinc in the Hon. Company's steamer "Pluto," when stationed in China, in 1848 and 1849; I have found it effectual in destroying the stench arising from bilgewater, leaving the atmosphere free from unpleasant smell. I am of opinion it is of the greatest utility as a deodorizing agent. I have used it as an application to foul ulcers, diluted, with the best results; also as injections in gonorrhœa and as an application to syphilitic ulcers.

I have no hesitation in stating that the frequent use of the chloride of zinc in the hold of the "Pluto," contributed to the healthiness of the ship's company while on that station. I am now on the Singapore station, where it is impossible to procure a supply, as it is very necessary for the hold of an iron steamer.

I have, &c.

(Signed) J. M. MILLER, M.D.,  
Honorable Company's Steamer "Nemesis."

Extract from the Journal of Mr. Alexander Muirhead, Surgeon of H.M.S. "Ganges," ending 28th June, 1850.

"During the period of this Journal, 200 cases of phlogoses, and 143 cases of ulcer have been placed upon the sick list. The ulcers were generally indolent and long in healing, the phlogoses were, for the most part carbunculoid furunculi upon the knees and legs, with large cores of sloughy half disorganised cellular membrane, and an erythematic blush around both; ulcers and furunculi began to appear in December, but became much more frequent in January and February, and in several instances the erythematic blush appeared on the feet and legs, where there was no open sore. In thirteen cases the reddened skin vesicated, forming erysipelas (not the exanthem, but the phlogosis erythema of Dr. Cullen). In four of these cases extensive sloughing took place, giving rise during the process of mortification to a most offensive fœtor, which tainted the air to the distance of eight or ten yards around the patient; this would have rendered him an insufferable nuisance both to himself and others, had it not been for the rapid efficacy of the chloride of zinc in destroying fœtor. It would be impossible for me to speak too highly of the benefit I derived from the use of this solution in those putrid cases. The manner in which I used it was to dilute Sir William Burnett's preparation with 130 times its volume of water, then to steep a piece of lint in it, and apply the lint to the sphacelating parts—covering the whole with a piece of oiled silk, to prevent evaporation; this, in the space of a few minutes, removed the fœtor entirely. It formed a soft and moist application to the sores, its astringency restrained the excessive formation of purulent matter, where the parts had sloughed, and healthy granulations sprang up under its use. When this unhealthy condition of the skin and cellular membrane of the lower extremities first appeared, I imputed it to the congestion in the vessels of those parts produced by cold and moisture, but when almost every sore became surrounded by erythematic redness, I could not help feeling impressed with the belief that it must depend upon some morbid influence arising from the condition of the ship herself, and with a view to correct this condition, the sick bay was mopped over every morning with diluted solution of the chloride of zinc; stoves were kept burning on the lower deck, and in the cockpit; and on the 19th December solution of the chloride of zinc, in the quantity and manner directed was poured through the air-holes and pumps into the well, and allowed to remain there for two days. The other ships of the squadron were healthy, and our people had not been exposed to the great causes of disease among seamen, (leave on shore and drunkenness), still the tendency to disease went on increasing. During the month of January, the number on the Sick List ranged between 70 and 80, and on the 5th February there were 86 upon the Sick List, and at the same time almost every sore threatened to become erysipelatous. I was aware of the beneficial effects which had followed the cleaning out, cleansing and ventilating hospitals in which erysipelas had



become prevalent; and I now felt it my duty to try, and, if possible, get the "Ganges" cleared out, more especially as her holds had not been cleared out when she was commissioned in March, 1848; with this view I wrote a letter to Captain Smith, on the 6th February, begging that he would be pleased to move the Commander-in-Chief to give direction that I might be favoured with the opinion of the medical officers of the fleet, as to the best means of preventing disease from spreading farther among us, and of removing that which already existed. On the 7th February the surgeons of the "Queen," "Caledonia," and "Vengeance," inspected our sick and the ship, in consequence of an order from the Admiral, and we were shortly after sent from the Piræus to Malta, at which place we arrived on the 11th March. Every thing was then taken out of the holds, the limber boards were lifted up, and the whole was well washed, first with water, then with solution of the chloride of zinc, then with whitewash, after which the holds were dried by stoves and wind-sails; the water-tanks were also whitewashed inside, and painted without, prior to being re-stowed. Thirty-one patients were sent to the Naval Hospital at Malta, and although nearly four months have elapsed since that time we have not had one case of erysipelas, and the number upon our sick list (formerly 86) is now only 21."

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*Letter from Dr. Robert Hastings, Acting Surgeon of H.M.S. "Medea," dated  
5th April, 1850.*

Bombay, April 5, 1850.

SIR,

Since I have been doing the duty of surgeon in this vessel, we have been in the habit of regularly pumping her out, and using the chloride of zinc in the holds and bilges, and I believe, in consequence, we have never had any smell from the bilge-water, which used to be, some years ago, so offensive, particularly in steaming, even under the free use of the chloride of lime, over which it possesses the advantages of being vastly more permanent and effective. Having had a great number of cases of dysentery in the summer of 1848, at Whampoa, when a great number of the patients were obliged to use bed-pans below deck, being too weak to go to the head, I had ample opportunity of proving its efficacy in completely destroying that smell peculiar to the disease, which is so offensive, if not infectious, particularly in crowded places, such as the lower deck of ships, &c., and in keeping the bed-pans quite sweet and free from any smell. I may also state that I have had on board, at one time, as many as nine burns, some of them very extensive and severe, and I found it effectually remove that disagreeable smell which must necessarily arise from an extensive burnt surface, particularly in a hot climate, the dilute solution was used over the cotton with which some of them were dressed, and, in some cases, a very dilute solution was used as a dressing to the sores with very good effect. I have been in the habit, for some time past, of using a weak solution as a dressing, in certain unhealthy and indolent ulcers, with good effect. You will see, from the remarks in the Nosological Returns, that I have used it as a remedial agent in chronic dysentery with complete success.

I have, &c.

(Signed) ROBERT HASTINGS, M.D., Surgeon (Acting).

Sir Wm. Burnett, K.C.H.,  
&c. &c. &c.

# INFLUENCE OF THE SOLUTION IN PREVENTING THE DEVELOPMENT AND THE SPREAD OF CHOLERA.

To explain how the solution of the chloride of zinc arrests the spread of cholera is not so difficult as might at first be imagined ; for although it cannot be proved (neither can it be denied) that it acts directly on the primary essential cause of the disease, it has, nevertheless, been established by the most incontrovertible facts, that *it has a peculiar and a powerful influence in preventing or destroying those peculiar local conditions of the atmosphere under which cholera is most frequently developed and propagated.*

Within the two last years we have seen that cholera generally confines its ravages to circumscribed localities,—sometimes to particular streets, or even to detached buildings, where the inhabitants are compelled to breathe an atmosphere polluted by unwholesome gases and effluvia, such as arise from foul drains, sewers, dung-heaps, and other accumulations of filth, in which there are animal and vegetable matters in a state of putrid decomposition. And further, it has been ascertained that in proportion as the atmosphere of a locality abounds in these health-destroying emanations, so is the liability to contract the disease the greater, while its fatality is fearfully increased.

Whether the effluvia and gases thus evolved are the means of sustaining the germs of the disease in the atmosphere, or whether, by first poisoning the blood and impairing the general strength of the individuals exposed to their influence, they thus fit the constitution for the reception of the cholera germ, need not here be inquired into ; it is sufficient, for the present, to bear in view that these are the conditions under which the disease most frequently breaks out, and proves most destructive. Such being the case, it is clearly obvious that if we deprive the air of these noxious principles, or prevent their being thrown into it, we shall diminish the proportional amount of sickness due to their presence. This, by referring to the preceding pages, it will be seen the solution of the chloride of zinc can effect in the most efficient and satisfactory manner. For instance,

“In a house in St. Andrew’s-street (Plymouth), occupied by fifty-two persons, it was sprinkled in every room, except four ;—in these the occupants would not permit it to be applied ; the result of which was, that in those parts of the house where it had been used, not a single case of cholera subsequently occurred ; while in the four rooms above alluded to, the disease still exists, and some deaths have taken place.

“Two houses immediately opposite were supplied with a quantity, in neither of which has there as yet been a single case, although the disease is raging in the neighbourhood.”

Dr. Benbow, surgeon to the Plymouth Board of Health, also remarks, with respect to two houses long exposed to the effluvia arising from accumulations of filth, that “in one of these houses, diarrhœa



"had long prevailed, affecting the whole members of the family; since the use, however, of the chloride of zinc, the disease has subsided, and they now continue in good health."

When a cloth, thoroughly moistened with the solution, and attached like a flag to a pole, is waved for a short time through the tainted air of a sick-room, it speedily destroys every trace of offensive odour, leaving the air pure, wholesome, and fit for respiration. When, however, the solution is poured over, or mixed with solids or fluids—such as human excretions, bilge-water, or the matters contained in drains or dung-heaps, from which offensive gases are constantly being extricated,—it is infinitely more useful, as it combines with the gases (particularly with sulphuretted hydrogen) at the moment of their liberation, and renders them innocuous,—or by chemically acting on the decaying substances, it altogether prevents their evolution. It is thus clearly evident that the solution—whether or not it has any influence on the problematical epidemic cause of cholera—acts as a powerful sanitary agent, by depriving the atmosphere of the conditions which impart additional force and virulence to the disease.

Since the practice of washing with the solution the whole interior of vessels chartered for the transportation of convicts has been adopted, there has not occurred in any of them a single case of cholera.

Should it be proved that cholera results from the presence of fungous germs in the atmosphere,—a theory which as yet has been questioned rather than denied,—the necessity of using the solution becomes still more apparent, as in that case, if properly employed, it will destroy not only these bodies, but it will also destroy that peculiarity of atmosphere which favours their diffusion, and if they resemble the germs of other minute fungi, supports their vitality. Dr. Budd, of Bristol, in a letter to the *Times*, respecting the discovery of these bodies (cholera sporules), and the best method of destroying them, has recommended that the solution of the chloride of zinc should be poured over the excretions the moment they are passed by the sick; or that the matters discharged by the sick should be received into a vessel containing some of the solution, in order that the infectious germs may be destroyed before they can, together with the effluvia, escape into the surrounding atmosphere. The medical officers attached to the "Menelaus" quarantine ship, in which convicts labouring under cholera were treated, state that they found the solution "particularly useful in freeing the bodies of the patients suffering from cholera, from that peculiar and disagreeable odour which arises from them during the latter stages of the disease." "By placing it in close-stools all effluvia was destroyed." Dry-rot is neither more nor less than a fungous growth, springing from invisible germs, similar in some respects to what the cholera germs are supposed to be; and it is in the same manner, to the destruction or to the prevention of the growth of the dry-rot germ, that the preservative power the solution has upon timber, is to be attributed. The same remarks apply to mould and mildew, the invisible germs or seeds of which are constantly floating in the air, but they will not germinate or grow on any substance saturated with the solution.

It will be seen that, whether or not the latter theory as to the specific

exciting cause of cholera be correct, it does not in the least degree detract from the views advanced with regard to the action of the solution on an atmosphere charged with deleterious gases, or weaken the grounds on which are based the proof of its diminishing the force, and retarding the spread not only of cholera, but of other infectious diseases,—the product, in too many instances, of the emanations from foul drains, cesspools, and other putrifying accumulations of civic filth. In a former edition, some extracts were given from an interesting report presented by the Surveyors, Messrs. Roe and Phillips, to the Commissioners of Sewers of the Metropolis. In these it is mentioned, that in some of the worst districts of the town, where the solution was used for cleansing foul drains and cesspools, the comfort of the inhabitants was not only greatly advanced, but that the property itself in many instances was much improved, and consequently increased in value.

*Extract of a Letter signed by Mr. E. Nolloth, Surgeon, and Mr. F. M. Rayner, Assistant-Surgeon of the Quarantine Ship "Menelaus," dated 6th January, 1849.*

"A further employment of the solution of chloride of zinc for six weeks on board the 'Menelaus,' during the prevalence of CHOLERA on board that ship, has tended to strengthen the favourable opinion we expressed of it on a former occasion, when cholera broke out at Woolwich (amongst the convicts) in October last. As a disinfectant its utility is in our opinion incomparably superior to anything of the kind we have ever employed, being perfectly free from all unpleasant odour, which is so much complained of in the employment of chloride of lime. We found it particularly useful in freeing the bodies of the patients suffering from cholera, from that particular and disagreeable odour which arises from them during the latter stages of the disease.

"By placing it in close-stools all effluvia was destroyed. After the process of purifying the hair which had been removed from the beds, no odour whatever could be perceived, although previously to its being washed with the solution, the smell was most offensive."

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*An account of the effects of the free use of Chloride of Zinc in a district visited by CHOLERA.*

MALIGNANT CHOLERA, of a very severe kind, having visited the village of Noss, near Plymouth, application was made by the Rev. Mr. Yonge, rector of the adjoining parish of Newton Ferrers, to Admiral Sir W. H. Gage, the Commander-in-chief, for the temporary assistance of one of the surgeons of the Royal Hospital at Plymouth; the resident surgeon, although assisted by another medical gentleman procured from Plymouth for the occasion, being unable to attend to the numerous cases, and to perform the laborious duties required both by day and night.

The following letters from Mr. Bowden, the assistant-surgeon of the Royal Hospital so employed; and also those from the Rev. F. W. Pulling, the resident clergyman of the parish, Mr. W. Spencer, the additional medical officer, and Mr. Giles, the surveyor of highways, bear testimony to the beneficial effects of Sir W. Burnett's Disinfecting Fluid, in removing the causes of the disease, and purifying



*Influence of the Solution*

the dwellings of the poor, of which nearly the whole village consists; and also to the fact that "*since its use all sickness has entirely disappeared from the village.*"\*

SIR,

Newton Ferrers, July 23rd, 1849.

I have the gratification to acknowledge the receipt of your notes, which I received yesterday, and forthwith communicated to Captain Nicolas that I thought I could conclude everything here on Monday, and return to the hospital.

I hope by to-morrow's post to forward you a concise account of what has been done at Noss. I now enclose three documents from the clergyman of the parish, the medical officer, and the principal resident; which I think bear such strong testimony to the efficacy of the chloride, both generally and in particular instances, that in my narrative I shall merely refer to these papers as an account of the result. The cases particularized by Mr. Pulling were extreme.

(Signed)

STEPHEN BOWDEN,  
Assistant-Surgeon.

Sir Wm. Burnett, Kt., M.D., K.C.H.  
&c. &c. &c.

SIR,

Newton Ferrers, July 23, 1849.

In compliance with the directions which I had the honour to receive, I repaired to the village of Noss, on the 6th instant. I found that, on the day preceding my arrival, there had been one death from cholera; and, during the previous seven days, five deaths, with twenty-five fresh cases either of cholera or diarrhœa. I forthwith proceeded to inspect the various nuisances with which the village abounded, and found above 100 (principally uncleansed pigsties, offensive heaps of refuse matter, foul drains, &c.) which I considered should be immediately removed or remedied. This having been accomplished, I proceeded with the use of the chloride of zinc, which, with two exceptions, was carried into every room in every house in the place; and it was also used generally, wherever filth, effluvia, or miasm was, or was likely to be harboured.

By fixing a kind of spreader on the delivery-pipe of a small engine, in a very few seconds the interior of an apartment was thoroughly sprinkled. Where it was impracticable to carry the hose, or where a larger volume of fluid was required, men were employed with buckets and brushes; and thus, extensive contact was insured, without inconveniently wetting the houses. This work occupied three entire days, during which 600 gallons of the dilute solution were poured away,—and I may here mention that, for the hulk in the harbour, the houses of refuge where the children are lodged, soaking the bedding of deceased and sick persons, &c., &c., above 350 lbs. of the strong solution have been expended, as I have caused it to be used freely wherever I thought it was required.

As to the effect produced, I must refer to the documents which I yesterday had the honour of transmitting, from the clergyman and medical officer of the parish, and the principal resident in the village; these will testify not only to the perfect deodorising power of the solution, but will also testify to the fact, that *since its use all sickness has disappeared from the village*,—that is, sickness partaking of the nature of the epidemic. Noss is situated on both banks of an arm of the estuary into which the river Yealm empties itself. On three sides it is closely and entirely surrounded with hills, at the base of which the dwelling-houses are immediately situated. At low tide, the lake is left dry, and a large surface of mud exposed; over this the tide moves sluggishly, with force sufficient to effect only a partial cleansing of the sewage; and thus, Noss is exposed to the local disadvantage of imperfect ventilation, and to the malaria daily arising from what is little better than a large ditch.

The population of the village is estimated at about 360 or 380. From the 6th of June to the present date there have been 130 cases of cholera, (40 of which proved fatal,) and above 300 cases of diarrhœa. Before that period there were nine deaths; but there are no means of ascertaining the number of cases of cholera and diarrhœa respectively.

\* A letter has been since received from the Rector of Newton Ferrers, under date 2nd of August, 1849, in which he states that, up to that time, no fresh case of Cholera had occurred.

But two or three families, amounting to twenty-two or twenty-three persons, have embarked on board the "Ringdove" hulk, moored in the harbour. There seems to be an unwillingness to leave their houses, particularly now that the disease has ceased among them.

(Signed) STEPHEN BOWDEN,  
Assistant Surgeon.

Sir William Barnett, Kt., M.D., K.C.H.,  
&c. &c. &c.

MY DEAR SIR,

Revelstoke, July 20, 1849.

I hardly know how to reply to your note, which I have just received, in which you request me to state what results (if any) I have observed, as *particularly* consequent on your using the chloride of zinc in my parish.

I can, indeed, bear *general* testimony to the efficiency of your sanitary measures, and the kind and prompt earnestness with which you have carried them out. The removal of the pigs, the dung-heaps, collections of refuse, &c., and the cleansing of the sties, privies, &c., so thoroughly performed under your superintendence, have certainly been most effectual in diffusing a wholesome freshness throughout our previously pretty, but not previously sweet, little hill-embosomed village; and this freshness I also, in a great measure, attribute to the free application of the chloride and water so universally distributed, both externally and internally, by jet from your fire-engine, and sprinkling from your brushes.

With respect to the efficacy of the chloride, I can testify to the great deodorization that took place in the house lately occupied by Josias Kingcombe, and infested by a musty, dirty smell, which yielded to no other cleansing operation but your zinc-water, which has almost, if not entirely, dissolved or expelled the noisome occupant of the premises.

Again, with respect to James Foster's privy, which was most foul; after removal of the soil, your engine being brought to work on the building, wonderfully deodorized the place, and rendered it as sweet as a summer-house.

I should also mention the bullock-shed close to the barn, which has been fitted up for the temporary accommodation of the children. For some days after the dung was removed, and the floor had been freely sprinkled with lime, a strong animal smell still prevailed, but the chloride, used in proportion of one to seventeen, and applied from a common watering-pot, did certainly, in a very short space of time, purify the air of the place, and (after two or three sprinklings) enabled us both to pronounce it fit for the reception of additional children, if so required.

I remain, &c.

(Signed) FREDERICK WM. PULLING.

S. W. Bowden, Esq., R.N.

DEAR SIR,

Newton Ferrers, July 22, 1849.

In reply to your request to have the result of my observations as to the past and present condition of Noss, it gives me great pleasure to be able to bear testimony to its great sanitary improvement.

With respect, especially, to your zealous and energetic application of the chloride of zinc to the habitations, the effect has been most satisfactory. Without specifying particulars, which might easily be done, I can safely affirm that the interior of the dwelling-houses and outbuildings generally has been *entirely* changed, as regards their purity of smell and atmosphere, and that, *pari passu*, the health and physical condition of the inhabitants have improved so, that in the village of Noss at this present time, and for some days past, I have had no case of cholera or diarrhoea on the sick list;—a matter not less of surprise than congratulation, considering its condition before you began your labours. I cannot avoid referring to the state of the "Ringdove," in the harbour, which I visited yesterday: the noxious smell from the bilge-water and lower parts of the vessel, which was so offensive before the use of the chloride of zinc, being totally removed, and the people on board greatly renovated by the advantage of enjoying a purer atmosphere.

I am, &c.,

(Signed) WM. SPENCER,  
Extra-Parochial Medical Officer.

Stephen Bowden, Esq., R.N., &c. &c.



*Influence of the Solution*

Noss, July 21, 1849.

SIR,

In compliance with your request, I have much pleasure in stating my belief in the power of the chloride of zinc, in completely removing all disagreeable and foul smells; of this we have had such abundant proof in the village, that no doubt can be entertained on the subject.

I am, &c.,  
(Signed) SAMPSON GILES,  
Master, R.N., Surveyor of the Highways.

*Extract of a Letter from Captain-Superintendent J. T. Nicolas. R.N., C.B., dated Plymouth Hospital, 2nd August, 1849.*

"Having had ten cases of CHOLERA in this hospital (brought into it) which terminated fatally, since the beginning of July, and not one person that attended on those patients having had the slightest symptoms of this disease, I attribute this *principally* if not *wholly* to the free use of the chloride of zinc, which has been constantly sprinkled in abundance in the wards where the cholera patients were; and, moreover, *immediately* after a death, the body has been wrapped in an old sheet that had been just dipped in the solution of zinc. The labourers and others, who have been employed about the bodies of the sufferers, have uniformly washed their hands and faces in the dilute solution before approaching the corpses.

Mr. McClure and Mr. Banks will send their reports to me to-morrow, relative to the positive proof they have witnessed of the *great efficacy* of the chloride of zinc, in various instances, in houses in this neighbourhood, where cases of cholera had appeared, and where the smells were intolerable until the zinc was used, when these pestilential effluvia speedily disappeared—'as if by magic,' to use the words of the persons who were inhabitants of these houses."

Royal Naval Hospital, Plymouth. August 13, 1849.

SIR,

I have the honour to inform you that I have now exhausted the supply of the chloride of zinc which was placed at my disposal, a few weeks ago, by Capt. Nicolas, in order that I might have an opportunity of testing its efficacy as a purifying agent, in those districts of this town where, for some time past, the CHOLERA has been raging with such fearful malignity.

In carrying out my instructions, I invariably selected the most filthy and wretched localities, where I used it, not only in the houses, but also in a number of foul drains, cesspools, &c., with most satisfactory results, having found it to be, without a single exception, quite efficacious in almost immediately destroying all noxious and offensive effluvia.

I have selected from my notes the following facts relative to the utility of your Disinfecting Fluid, and which are, in my opinion, well worthy of notice.

In a house situated in a court leading out of Stonehouse-lane, where the disease had prevailed to a considerable extent, I found a poor woman suffering from cholera; the room which she occupied seemed to be a kind of cellar; it was quite dark, and without any means of ventilation whatever; the entrance was through a long narrow passage, at one end of which was an open drain, into which a water-closet emptied itself. The smell arising from this was of the most offensive description, and to me quite intolerable. I caused a strong solution (one part of the chloride to twenty parts of water) to be plentifully sprinkled about the room and passage, and also some to be thrown into the drain; this was again repeated in the course of the afternoon, and on my return on the following day I was unable to perceive the least trace of any unpleasant odour.

In another court, where there was a large cess pool adjoining a privy, I used the chloride with the usual well-marked benefit. Previously to my visit, the horrible stench emitted from both places was an annoyance so the entire court, and was bitterly complained of by the inhabitants, yet the occasional use of the chloride kept it comparatively pure and inoffensive.

In a house in St. Andrew's-street, occupied by fifty-two persons, where the cholera had made its appearance, the chloride was used for the purpose of attempt-

ing to purify the place; it was sprinkled about every room, except four, in which the occupants would not permit it to be applied; the result of which was, that in those parts of the house where it had been used, not a single case of cholera has since occurred; while in the four rooms above alluded to, the disease still exists, and some deaths have taken place.

Two houses immediately opposite were supplied with a quantity, in neither of which has there as yet been a single case, although the disease is raging in the neighbourhood.

I could, were it requisite, mention a number of instances similar to the foregoing, as to the advantages resulting from the use of the chloride of zinc; but I think there is no necessity for my entering into any further details at present. I may mention, however, that so convinced are the medical gentlemen who have charge of the cholera hospital of its utility, that, on their recommendation, the Plymouth Board of Health have ordered a large supply from London for the use of that establishment.

Enclosed are a couple of letters which I received yesterday from two medical practitioners, and which I am permitted to place at your disposal.

I have the honour to be, &c.,

(Signed) A. M'CLURE, A. M.  
Assistant-Surgeon, R.N.

Sir William Burnett, K.C.H.,  
&c.      &c.      &c.

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To A. M'Clure, Esq., R. N. Hospital, Plymouth.

SIR,

In compliance with your request, I give you the result of the use of the Disinfecting Fluid committed to my charge; the quantity was sufficient only for two houses, the privies of which had long been in a most offensive state. The fluid was used according to your directions, and, much to my surprise and delight, all noxious effluvia rapidly disappeared.

I may state that, in one of these houses, diarrhœa had long prevailed, affecting the whole members of the family; since the use, however, of the chloride of zinc, the disease subsided, and they now continue in good health.

In conclusion, allow me to thank you for the indefatigable manner in which you acted on the first outbreak of cholera in my district. The poor are deeply indebted to you for the removal of many nuisances, the existence of which, I doubt not, would have proved fatal to many.

I am, &c.,

(Signed) JOHN BENBOW, M.D.,  
Surgeon appointed by the Board of Health, No. 2 District.

Oxford-place, Plymouth,  
11th August, 1849.

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Cholera Hospital.

DEAR SIR,

I am so much pressed for time, that I cannot go so fully into the subject of your note as I could wish; but I have no hesitation in saying that I have the highest opinion of the value of Sir W. Burnett's Disinfecting Fluid—the solution of the chloride of zinc. My experience of its utility on board H.M.S. "Tyne," whilst in charge of the German emigrants suffering from cholera, and subsequently in Stonehouse-lane, and at this time in the cholera hospital, has been sufficient to enable me to form a decided opinion on the subject. I much prefer it to any other I have seen.

(Signed) FRANCIS FOX,  
Surgeon to the Cholera Hospital, Plymouth.

A. M'Clure, Esq.  
14th August, 1849.



*Influence of the Solution**From John Bowler, Esq., Surgeon R.N.*

20, Upper South-street, Gosport, August 29, 1849.

Sir,

I have to apologise for not acknowledging the receipt of your letter of the 27th ultimo, in answer to my inquiries respecting the use of your invaluable solution of the chloride of zinc; but my time has been so fully occupied with the removal of disease throughout this large and populous district, that I thought it would be better to delay doing so until I had fully convinced myself of its efficacy as a *disinfectant*, and with the hope that the town authorities would employ it on a larger scale than I have been enabled to do. My endeavours, of course, have been confined chiefly to the sick chamber, where, I am thankful to say, I have found its use of the utmost importance in almost magically dissipating the unwholesome and offensive smells, arising from the external and internal excretions and exhalations of the human body suffering from cholera; its good effects were not only observable upon those already attacked with the disease, but in checking a further spread of this fearful malady among those in attendance about the sick; and I have no hesitation in bearing testimony that many valuable lives have been spared by its use, which otherwise would have fallen a sacrifice.

Since the 18th ultimo, I have had under my care nearly four hundred cases of CHOLERA and Choleraic diarrhoea, many of which were strongly marked by symptoms of extreme virulence and malignity. However, I am rejoiced to say, that only sixteen of that number have fallen victims to the disease.

You are aware that the town of Gosport, in many parts, is densely populated, abounding in miserably crowded courts and alleys, and hitherto but indifferently supplied with water, having a most inefficient and superficial drainage, consequently favourable to the propagation and maintenance of epidemic disease; but by the sanitary means adopted, it has now assumed a more healthy appearance.

I remain, &amp;c.

(Signed)

JOHN W. BOWLER.

Sir William Burnett, K.C.H.

*Extract from the Medical Report of Mr. B. Verling, Surgeon of the Naval Hospital, at Haulbowline.*

"On the first appearance of the disease on the island (Haulbowline), I recommended among the people to pay all attention to the cleanliness of the localities about their houses, with as much ventilation through the houses as possible. On the houses being made clean, I supplied among them generally, and to a liberal extent, the solution of the chloride of zinc, diluted with twenty parts of water. I had tubs containing twenty gallons of the mixture placed near the houses, to be used by the people *ad libitum*. There were some old flannels and blankets remaining in store, which had been condemned; these I divided among the people, with instructions how to use them with the solution: they did so use them with attention, and in the most appropriate manner. There are some sewers, which were extremely offensive, running under the houses, and terminating in a *cul de sac*,—large quantities of the solution were from time to time thrown into these sewers, and every taint of bad smell was thereby rapidly removed, and the atmosphere in the houses, and about, kept quite free of any offensive odour. After the first application of the solution, I had no occasion to urge its further use, as the people became so sensible of its good effect, that they continued its use in a satisfactory manner. *The consequence has been, that I am unable to say how many cases of cholera we really had*, for the disease became so mitigated in virulence, that there were many cases of vomiting, purging, lividness, and coldness of the surface, which can scarcely be put down as malignant cholera; yet I believe would have been so, but for the precautions taken. On the Ordnance side of the island, separated from us only by a wall, the cases were much more numerous, and more malignant in character. The medical attendant on that side is a private practitioner, and finding the disease extending, applied for and was supplied per admirals order from the hospital, with the solution. After its use, he, I believe, found the disease checked, and the cases which did occur were of milder type. We have had in the hospital typhus, small-pox, and nearly all the diseases of a contagious nature,

and we have not had one single instance of any of these diseases being propagated by contagion; in isolating any cases, I have been more influenced by the consideration of the repose of the patient, than by apprehension of the spread of the disease. From a good deal of experience, I feel very fully convinced of the efficacy of the choride of zinc in counteracting the spread of contagion; and in the hospital, the nurses, who are not generally disposed to give themselves more trouble than they can help, use the solution most assiduously, which, I believe, arises from their own conviction, from observation of its power."

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"Unite," Convict Ship, Woolwich, November 30, 1843.

SIR,

The CHOLERA having happily ceased, we feel it our duty to bring to your notice the advantage resulting from the use of the chloride of zinc, as a destroyer of all foetid exhalations, and as one of the most powerful disinfectants with which we are acquainted. We used the solution in the "Warrior" and the "Justitia" with good effect, but it was in the hospital ship where we had the best opportunity of practically testing its great utility. This ship is remarkably well ventilated, and the chloride of lime has always been used; we therefore directed its discontinuance, and in its place used the zinc; we consider the advantages of the latter to be great and incontestible: *it destroys all offensive effluvia more perfectly than the former*, leaving the atmosphere around free from all unpleasant smell, while the chlorine from the lime is to many peculiarly offensive. One patient, labouring under abscess of the lungs, was so offensive, as to be scarcely approachable; the solution removed all odour, and so contributed to the patient's comfort, that he requested to be allowed to use it as a gargle, and to wash the surface of his body with it, declaring that he found great relief from its use.

The patients were allowed to have either the lime or the zinc, as they chose, to sprinkle the bedding and place in the close-stools, but they invariably preferred the zinc, stating that the odour of the lime was offensive, but the zinc had no unpleasant smell.

So strong is our opinion of its utility as a deodorizing agent, that we shall never cease to use it on all occasions when an agent of that kind is required, and we recommend, most strongly, its general adoption in every department of the Convict Establishment. In the Naval Service it is properly appreciated. To the Mercantile Marine it would be invaluable; for when offensive smells arise from a hold which cannot be cleansed, the free use of the solution would remove all these, and at the same time preserve the woodwork of the ship, which we believe to be always undergoing decomposition, when noxious effluvia are evolved.

(Signed) G. H. DABBS, *Surgeon, R.N., Medical Superintendent,*  
*Woolwich Convict Establishment.*

EDWARD NOLLOTH, *Surgeon, R.N.*

FREDK. M. RAYNER, *Assistant-Surgeon, R.N.*

H. P. VOULES, Esq., *Superintendent of Convicts.*

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*Extract of a Letter from P. F. Govett, Esq., Chairman of the Plymouth Board of Health.*

GENTLEMEN,

Inclosed I send you a banker's order for the amount of your Bill.

From the reports of our medical and relieving officers who used it (the Disinfecting Fluid) during the cholera in the infected houses and rooms, it had the most decided effect by disinfecting the places, and there was no return of the epidemic; whilst in those places where the inmates refused having it used, the disease broke out a second time.

I remain, &c.

(Signed) P. F. GOVETT,  
*Deputy Chairman.*



*Influence of the Solution*

Lemon Villa, Truro, 27th September, 1849.

SIR,

Conceiving it to be my duty, I have the honour to enclose a statement of Dr. Paddon,—the result of his experience of the efficiency of the chloride of zinc, as a disinfecting and deodorizing agent. As I was associated with him both at Mevagissey and in this town, and having been an eye-witness to the distressing scenes and events to which he alludes, I can bear my strongest testimony to the accuracy of his statements; and I can confidently add, that the value of the solution requires only to be known, to be appreciated and employed.

From the clerks of the boards of guardians, &c., in the surrounding districts where the epidemic has prevailed, I have similar strong testimony of its powers.

I have the honour to be, &amp;c.,

(Signed) JNO. ANDREWS,

Surgeon, R.N.

Sir William Burnett, K.C.H.,  
&c. &c. &c.

MY DEAR SIR.

Truro, September 27, 1859-

Having had my attention directed by you to the Disinfecting Fluid of Sir Wm. Burnett, I have great pleasure in stating that the result of my experience is strongly corroborative of the favourable opinion which you had previously formed of it.

As consulting medical officer at Mevagissey, during its late severe visitation from malignant cholera, I had most abundant proofs of its value in removing from the sick-rooms of the poor the nauseating smell so peculiar to dirt and disease, and am decidedly of opinion that its free use was of the greatest service in arresting, in diseased localities, the progress of the disease.

From the impossibility at one time of procuring nurses, the condition in which some of our patients died was most deplorable; and the removal of the body and destruction of the bedding could not have been safely performed but for the solution of the chloride, which was, in such cases, most freely used, and in every instance acted as a perfect deodorizer.

The extent to which Sir W. Burnett's Fluid will bear dilution, the readiness with which it can be applied, and its perfect freedom from any disagreeable odour, constitute its peculiar advantages.

I am, Sir, &amp;c.,

(Signed)

JOHN PADDON, M.D., London.

To John Andrews, Esq., R.N.

*Extract from a Special Report on Cholera, by Dr. Rae, Inspector of Hospitals, &c.*

"With regard to prophylactic measures:—when the patients were admitted, they were at once carried into a clean, well-aired ward, stripped of their clothing (which was taken to the wash-house, and put into a dilute solution of the chloride of zinc), and placed in a clean comfortable bed, which, with the ward itself, was sprinkled with the solution. This was also used in the bed-pans, night-chairs, and water-closets, so that no noxious smell could arise. Even the bodies of the sick themselves were sometimes sponged with the solution, tepid, and much diluted, when the least offensive emanation was perceived.

Of this powerful deodorant and disinfectant—having now had long experience—I cannot speak in too high terms: during the prevalence of the late pestilence, it has been used not only in the cholera wards, but in every ward in the hospital, as well as in the adjoining private dwellings, and the total immunity which we have enjoyed, both in the latter and within the walls of the hospital, would almost corroborate the fungous theory of the disease, and lead to the belief that the minute spores or germs of these bodies are immediately annihilated, the instant they come in contact with this fluid. It has been observed that cholera has ceased in one part of a thickly-inhabited house, in which the solution was used, and continued its ravages in another, where the solution was not used. Mr. Bowden reports that the washerwomen at Noss suffered from cholera, which led to the supposition of infection, but that, after the free use of the fluid, they entirely escaped, and the disease began to decline."

*From the Rev. Richard Dunning, to Dr. M'Clure.*

In answer to your request that I would give you my opinion of the qualities of Sir William Burnett's chloride of zinc, I have no hesitation in saying, that I believe them to be, as far as my observation has enabled me to judge, *most valuable*. As to the deodorizing power of the preparation, I can speak from my own experience, having witnessed the almost immediate removal of the most noxious, positive *stink* from a drain and cess-pit, into which I poured some of it, in the proportion recommended. I have also a very high opinion of its powers as a disinfectant. Two or three persons lost their lives in one place, I have no doubt, from incautiously washing bedding, &c., of persons who died of cholera; whilst I am not aware of the slightest inconvenience occurring to any one who did so, and who had properly used the chloride of zinc. I have no hesitation in saying, that I believe it to be a most valuable preparation.

(Signed)

RICHARD DUNNING,  
Incumbent of Torpoint Chapel,  
Autrey, Cornwall.

Torpoint, October 6, 1849.

*From Captain Wriford, R.N., to Sir William Burnett.*

Torpoint, October 8, 1849.

I have very great pleasure in communicating to you, as far as my humble ability will allow, my opinion of the value of the chloride of zinc, having witnessed the use of it in the houses of the severest cholera cases. Some of the attendants caught the infection previous to using the chloride, as directed by Captain Nicolas; and it is a strong proof of its efficacy, that none who washed the infected linen, in the water prepared with zinc, died; but two that did not, fell a sacrifice to the disease. And I also beg to state, where the effluvia of a drain was bad, that almost instantly after the zinc was applied, it ceased to give out smell; and I have no hesitation in saying, I think its properties are most valuable in all cases of infectious disease, and for purifying drains.

If I have not sufficiently expressed myself on the subject, name it, and I shall be most happy to attend to your wishes.

I have, &c.

SAMUEL WRIFORD, R.N.

Sir William Burnett, M.D., K.C.H.,  
&c. &c. &c.

*From Captain Wriford, R.N., to Dr. M'Clure.*

Torpoint, October 11, 1849.

I have much pleasure in giving you my opinion about the utility of the chloride of zinc. Of its deodorizing powers I had full testimony whilst the cholera was amongst us, having often used it in drains, and can assert the effects were immediate and unmistakeable. Of its disinfecting powers also, I have the highest opinion, as the women who washed the bedding of persons who had died of cholera, felt not the slightest inconvenience; whilst others, who did not take the precaution of using the chloride of zinc, and other hints suggested to them, fell victims.

Believe me, &c.,

(Signed)

SAMUEL WRIFORD.

*Sanitary Report of Drs. Forbes and Manford, of Inverness,  
21st August, 1849.*

"The various sanitary measures recommended for the districts presently affected with cholera, should, in so far as applicable and necessary, be carried out forthwith throughout the whole town, more especially in all localities inhabited by the poorer classes. The cesspools should be frequently examined, and kept clear of filth. They should be cleaned at an early hour in the morning, and previous to the operation a quantity of the solution of the chloride of zinc should be poured into them,



*Influence of the Solution*

and well stirred into the filth. This agent will decompose the noxious ingredients of the filth, and prevent the exhalation of the usual foul and deleterious effluvia from the cesspools while being cleaned."

*Extract of a Letter from Dr Forbes, of Inverness.*

"Having had an extensive charge of cholera cases during the recent epidemic here, I am enabled to state, after a fair and extended trial (with the sanction of the local authorities) given to your solution of the chloride of zinc, that I can fully corroborate the high opinion which others have expressed of its great value as a deodorizing and disinfecting agent.

I employed it in purifying the houses of cholera patients, with the most beneficial results,—both to the sick, and as a preventive of the spread of the malady. It was extensively applied by our police in our affected localities, and its influence in destroying all foul effluvia was truly marvellous. Its use had the effect of diminishing alarm, and creating confidence in the minds of the people. I also applied it in a diluted and tepid state as a wash, morning and evening, to the surface of the body, in several bad cases of typhoid fever, with the happiest results."

*Extract of a Second Letter from Dr. Forbes, dated 26th November, 1849.*

"Cholera had broken out in one of our large hotels, and I at once directed the use of your preparation. It operated like the spell of a magician, in improving the close, heavy atmosphere in the apartments and passages. It was one morning sprinkled through the family apartment, and the landlady remarked to me that, on entering the room in ten minutes after, she was surprised and pleased to find the air—previously oppressively close and heavy—as sweet and pure as that by the sea-side.

The case of cholera which had occurred in the hotel in question was a bad one, and proved fatal. Some of its many inmates were subsequently attacked, but in all the cases after the use of the chloride, the malady was mild and easily cured.

Our superintendent of police has promised to send his testimony of the utility of the solution of the chloride of zinc, and, if received in time for the post, I shall transmit it, enclosed."

(Signed) W. W. FORBES.

Sir Wm. Burnett, M.D., K.C.H.,  
Admiralty.

*Certificate from David Anderson, Esq., Superintendent of Police.*

Inverness, November 26, 1849.

I hereby testify that, by direction of the authorities of this town, I lately applied Sir William Burnett's solution of the chloride of zinc, during the prevalence of cholera, for the destruction of the noxious effluvia proceeding from the public cess pools and channels, and existing in ill-conditioned lanes and courts, and that its effects were most admirable. Its use instantly and effectually extinguished all offensive smells, without producing any of its own, and I consider it to be a valuable means of promoting the comfort and health of the inhabitants of towns.

(Signed) DAVID ANDERSON.  
Superintendent of Police  
for the town of Inverness.

Inverness. 27th September, 1849.

Herewith I take the liberty of sending you the "Inverness Courier," of this date, in which the solution of the chloride of zinc is noticed.

Although recommended some time ago to the authorities of this burgh, by my friend Dr. Forbes, it appears that it was not extensively used till Tuesday last, when an alarming increase in the number and severity of cholera cases took place. On that day, however, it was used by their direction in earnest, and I trust in such a way as to insure its beneficial effect.

A bottle of it was sent, I understand, to every house in which the disease had appeared, and I had the pleasure of seeing the police carrying it in large watering pans through the streets, for distribution in all suspicious localities.

On reference to the official report of the health of the town, it will be found that, on the day after its use, only two cases occurred, whereas, no less than eighteen were reported on the previous day.

(Signed) J. ALLAN.

Sir William Burnett.

*Extract from the Report of Mr. Thomas Swan, Registrar, and Nuisance Inspector under the Board of Guardians, on the state of Bishopwearmouth, South and North Districts.*

"Mr. Swan sets out with a list of nineteen deaths of persons of different ages from cholera, in Bishopwearmouth south district, in the period from November 30, 1848, to November 30, 1849; and of fifty-four in Bishopwearmouth north district during the same period: in the whole of which cases there is detailed some positive nuisances and defective sanitary arrangements which might have been expected to attract to the various localities mentioned, or aggravate the epidemic that might for the time be raging. The report then proceeds \* \* \* \* \* 'by the suggestion of a friend I used Sir William Burnett's patent disinfecting fluid, which I applied to a considerable extent, and have proved its efficacy, not only in lime-washing, but in its application to closely confined rooms and infected atmospheres. The immersion of linen, &c., in it, after death, proved also to be of very essential service, and I take it to be the best disinfecting agent that I have met with.'—*Sunderland Times*, 28th December, 1849."

*Extract from a special Report on Cholera, by A. M'Clure, Esq., M.A.*

"Torpoint is situated on the western side of the river Tamar; the principal streets are of considerable breadth, but the houses, for the most part, seem to have been built without any regard to comfort or ventilation, more especially those in the narrow courts and lanes; the privies are very few in proportion to the number of the inhabitants, there being in some instances but one for the accommodation of sixty or seventy persons; the sewerage is extremely bad; but the greatest evil from which the people suffer is the inefficient supply of water.

During the three weeks previous to my arrival, thirty-nine deaths had taken place; twelve of these occurred in the Union Workhouse, which closely adjoins the town. Such a state of things rendered it absolutely necessary that prompt and energetic measures should at once be adopted, in order to improve the health of the place, and prevent, if possible, the further spread of the epidemic.

Having been requested to take charge of the Union Workhouse, in which the disease originally broke out, I immediately caused the solution of the chloride of zinc to be used in every apartment; since which, not a single case of cholera has taken place in the building. Three houses of refuge were provided by the board of health, for the reception of persons from the infected districts; each room of which was every day, under my superintendence, plentifully besprinkled with the solution, and the residents in them enjoyed a perfect immunity from the epidemic.

Two or three women, who had been employed in washing the clothes of cholera patients, were in a short time afterwards seized with the disease, and fell victims to it; on learning this circumstance, I caused the bedding, bed-clothes, &c., of persons who had been affected with the malady, to be steeped for forty-eight hours in a solution of the chloride of zinc, previously to being washed; and since this has been done, no such calamity has occurred. I have invariably used it on all occasions in the rooms of the sick, where it has had a most powerful influence in overcoming the unpleasant smell arising from the excretions of the patients, and in keeping the apartments comparatively pure.

I could relate numerous facts similar to the above, but I think these are sufficient to show the great advantages to be derived from the use of this sanitary agent; for the last twelve months I have had daily opportunities of testing its efficacy, under a variety of different circumstances, and I am fully convinced that, both as a deodorant and a disinfectant, it has no equal.



*Influence of the Solution*

In a former report on this subject, I mentioned a few favourable results, arising from the use of the solution, which had come under my own observation, on the first outbreak of the cholera in Plymouth, in July; I had also the honour of sending you some testimonials from private practitioners, who had the charge of cholera patients in that town; since that time I have had frequent opportunities of meeting and conversing with a number of the medical gentlemen in this part of the country, and *all of them, without a single exception, speak of it in the highest terms.*"

(Signed)

A. M'CLURE, A.M.,

Assistant Surgeon, R.N.

Sir William Burnett, K.C.H.  
&c. &c. &c.

*Letter from Mr. R. C. Russell, Assistant Surgeon of H.M.S. "Illustrious," dated 96th April, 1850.*

SIR,

H.M.S. "Illustrious," Portsmouth, 26th April, 1850.

Knowing the strong feeling existing just now in the public mind, if possible, to discover some agent which may mitigate the scourge of cholera, should it reappear during the approaching summer, I most respectfully take the liberty of enclosing a letter just received from my brother, the Rev. A. D. Russell, on the subject of your solution of the chloride of zinc, and you may make any use of it you deem fit. He was Curate of the parish of St. James, Bermondsey, during the prevalence of cholera in that most infected district of London, and from the success attending his use of the solution, I make no doubt if its efficacy (in destroying foul odours, and in cleansing the polluted sources of miasma) were more generally known to the public, that the solution would be universally adopted. In addition to his strong evidence in its favour, I can also state that in the "Sidon" steam frigate, during her late commission, I had ample opportunities of testing its virtues. From the peculiar construction of the ship's bottom, much bilge-water accumulated, and was with difficulty got rid of; the solution was always used in large proportions, and with the most *invariable* success, in quite removing any unpleasant smell, and a "sweeter" and more wholesome ship's hold there was not in the squadron.

The solution was also much employed in correcting the offensive smell of foul ulcers, and in checking the progress of phagedenic ulceration of the genitals and groins, in the inveterate venereal contracted by the men while at Naples.

Should you deem these remarks worth your notice, I beg you will pardon the liberty I am perhaps taking in submitting them to you.

I am, &amp;c.,

(Signed)

R. CROKER RUSSELL,

Assistant Surgeon.

Sir Wm. Burnett, K.C.H.  
&c. &c. &c.

[ENCLOSURE.]

Clerical Club, 36, Southampton Street, Strand,  
April 20, 1850.

MY DEAR RICHARD,

In reply to your note, requesting me to state what I know of the beneficial effects of Sir Wm. Burnett's deodorizing fluid, I have great pleasure in stating that I found it of great use as a *disinfecting agent* during the late fearful time of cholera. Bermondsey was, as you know, the very "ward" of cholera, and might be well called the "Jessore" of London. In fact, to use the words of an able journal, "it might be mapped out pathologically, and divided into morbid districts and deadly cantons." In such districts it became matter of anxiety to use the best deodorizing agent that could be found. I selected Sir Wm. Burnett's chloride of zinc, which I employed with considerable and *invariable* success, and I have no hesitation in stating my belief, that if I had been enabled to have used it extensively, we should have had a decrease in the mortality.

It acts almost instantaneously in arresting the mephitic vapours so favourable to typhoid and cholera disease, and though, perhaps, it does not destroy the *cause* or

deadly miasma, yet it prevents for a time, at least, its destructive effects. It is cheap, has no unpleasant or unwholesome smell, and is altogether the best thing of the sort I have ever used. If cholera returns this summer, I shall certainly, if spared, use it again.

I am, &c.,

Your affectionate brother,  
(Signed) ABM. R. RUSSELL.

C. R. Russell, Esq.,  
&c. &c.

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*Extract from the Journal of Dr. David Geddes, Surgeon of H.M.S. "Poictiers,"  
between 18th March, 1849, and 17th March, 1850.*

"On examining the vessel below, it was found that a smell of a very disagreeable nature was emanating from the engine-room, and from the deck on which the crew messed and slept. To obviate this source of discomfort, if not of disease, as far as possible, the ship, though to all appearance clean and in good order, was thoroughly washed, dried, and ventilated, and the use of the chloride of zinc, diluted according to directions, was immediately commenced. From this time the offensive smell entirely disappeared. And here I consider it my duty especially to state, that as soon as the use of the disinfectant had been regularly established in this, and the other ships, belonging to the ordinary at Chatham, diarrhœa, which had been prevailing epidemically, began to subside, and in no instance did it subsequently pass on to the stage of confirmed cholera."











Contest





# THE FLAX MOVEMENT;

ITS NATIONAL IMPORTANCE AND ADVANTAGES,

WITH DIRECTIONS FOR THE PREPARATION OF

FLAX-COTTON,

AND

THE CULTIVATION OF FLAX.

BY THE

CHEVALIER CLAUSSEN.

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Third Edition, with Additions.

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EFFINGHAM WILSON, 11, ROYAL EXCHANGE;

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AND

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*Price One Shilling.*



## THE LIFE OF

JAMES M. SMITH

BY JAMES M. SMITH

## CHAPTER I

James M. Smith was born on the 1st of January, 1840, at the village of Smith's River, in the State of New York.

His father, John Smith, was a farmer and a merchant, and his mother, Mary Smith, was a daughter of a farmer.

James M. Smith was educated in the common schools of his native State, and at the State University of New York.

He was a member of the State Bar, and a member of the State Bar Association.

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## NOTE TO THE THIRD EDITION.

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IN issuing a new Edition, I have merely to make one alteration; that is as regards the price at which Flax can be prepared as Cotton. Practical experience enables me now to say that British Cotton may be manufactured at *3d.*, and even as low as *2½d.* per lb. This is stated in a prospectus issued for establishing a Company for the manufacture of the article, which I now append. I also annex the remarks from the Morning Chronicle of the 1st August, reviewing the articles I have exposed at the Exhibition. Similar favourable remarks have been bestowed by the Press generally, but which it is needless to recapitulate.

The natural sagacity of the Americans is also directed to this subject, as may be seen by two extracts made from their newspapers.

P. C.





# THE FLAX MOVEMENT

AND

## ITS NATIONAL IMPORTANCE.

THE subject of an extension of flax culture in the United Kingdom, is one which, at the present moment, engrosses a considerable share of attention, amongst nearly all classes of the community. The present government appears to be deeply sensible of its importance; for in a communication from the Board of Trade to some gentlemen who had applied for a charter of incorporation for a company to be formed for the purpose of promoting the growth of flax in Ireland, my lords stated that it was not usual to grant charters of a commercial character in such cases, but

"That taking into consideration the present circumstances of Ireland, and being strongly impressed with the great importance of encouraging at this time, by every means, the cultivation of flax in that country, they would be disposed to relax the rules by which they are governed under ordinary circumstances."

Lord Clarendon, in an address delivered by him on the occasion of his visit to Belfast in September last, said,

"The great and growing importance of flax in Ireland cannot, in my opinion, be over estimated; and the more we consider it in its agricultural, manufacturing and commercial bearings on our welfare, the more apparent will, I think, become the necessity and advantage of its extended cultivation, in a country where soil and climate are so peculiarly adapted to its production; and I rejoice to think that attention is now so generally turned to this subject, and at a moment when flax is most likely to be remunerative to the grower.

"The demand for our linen manufactures is rapidly rising, and the supply of cotton is not only deficient, but, owing to various circumstances, I fear that this supply will, henceforward, not be equal to our demand, and that we cannot reckon upon the quantity of cotton we require at the prices which will enable us to extend our manufactures, or even to keep them up to their present amount. But, by extending the growth of flax, we may not only benefit the manufactures of Ireland by a more abundant supply of raw material, but we may also furnish the manufacturers of cotton—not with a substitute, but with an auxiliary to cotton—with a material which may liberate cotton from some of its present uses."



Mr. G. R. Porter, the Secretary to the Board of Trade, in a very able paper read by him before the British Association, at its last meeting in Edinburgh, on the statistics of the cotton trade in Great Britain, after referring to the continued and increasing deficiency of the supply of that article from the United States, said,

"The uneasiness which it is natural to feel, under the circumstances here described, has led to the enquiry, as diligently and as carefully as opportunity has allowed, whether some substitute or auxiliary may not be called into action, which shall meet the evil that threatens us; and this, it is suggested, may be found in a kindred branch of manufacture—that of flax. . . . . Hitherto, we have in this kingdom been greatly dependent on our foreign importations for supplies of flax; and, while the law imposed restrictions upon the importations of grain for human food, there existed a kind of moral impediment in the way of increasing our home growth of articles for any purpose not of equal primary necessity. That impediment is now removed, and there can be no reason given why our fields should not be henceforth used for the production of any article that promises an adequate profit to the farmer. It is especially desirable so to apply the productive power of the soil for the supply of articles as indispensable to the support of millions of our people as corn itself; and an additional inducement to the growth of flax, beyond that offered by other articles, may be found in the fact, that to bring it to the same condition as that in which it is usually imported from foreign countries, calls for the employment of a considerable amount of human labour. There is no part of the United Kingdom in which the flax plant cannot be successfully cultivated."

The Royal Agricultural Society of England, feeling the importance of the subject in a national point of view, has already in the present session, devoted three of its weekly councils to its consideration and discussion; and upon two of these occasions, the respected chairman, Mr. Pusey, M.P., expressed a hope that recent discoveries connected with the preparation of flax, would "constitute a new bond of union between the farmer and the manufacturer of this country." The *Times* in its notice of the proceedings of the society, states—

"That the greatest interest was manifested in the proceedings, which must be regarded of unusual importance to the agricultural interest, especially at the present time, when it becomes so necessary for the cultivators of the soil to look around them, and re-model their system of farming so as to restore its remunerative and prosperous character as a branch of national industry."

The *Morning Chronicle*, which has taken the lead on the subject, has, for several months past, been endeavouring to awaken the attention of agriculturists to the great advantage which, both in

a national and individual point of view, would result from an extension of flax culture; and in the first of a series of very able articles on the subject, published in that journal, it states—

“ At the present time, when our manufacturers are searching far and wide for such a supply of raw materials, as many render them in some degree independent of the chances of unfavorable seasons in other countries; and when our agriculturists are complaining of low prices, the subject of an extended flax cultivation is one well worthy of most serious consideration.”

A considerable amount of interest has also been felt on the subject by the local press throughout the country.

The question of flax-culture is one which is not now for the first time brought before the public, on the contrary, its importance has been recognised from the earliest times, and it has formed the subject of repeated legislative enactments at various periods, from the time of the 24th of Henry VIII., when it was enjoined upon every person “ occupying land, apt for tillage, should for every sixty acres, sow one rood, at least, with flax,” down to the year 1809, when a sum of £20,000 was appropriated to encourage the saving of flax seed in Ireland. The subject has also been repeatedly brought before the public during the last ten years, in the annual reports of the Royal Irish Flax Society, and in the various publications of Mr. Warnes, and other persons who have applied themselves to its cultivation.

The object of the following pages is to set forth a few of the leading features connected with this great movement:—the new and varied uses to which it has been found that flax is applicable, and the complete removal of those prejudices and objections to its growth and preparation, which up to the present time have been so generally entertained by the agriculturists of this country.

#### OBJECTIONS TO THE GROWTH OF FLAX CONSIDERED.

It may very naturally be asked, Why, if the cultivation of flax be so advantageous, it has not been more generally carried out in this country? The answer to such an inquiry may readily be found in the difficulties which have hitherto existed with respect to its preparation; and the uncertainty of the market for the produce when so prepared. Objections, founded on the character of the crop, and the comparatively high prices of wheat, secured to the grower have also, no doubt, had some influence in preventing the cultivation of a plant which was considered to be highly exhaustive, and which had not the advantage of a protective system. With regard to the latter of these causes, recent changes in our commercial policy, of the propriety of which no



opinion is here expressed, have, however, now placed the flax and the corn crops upon the same footing, and the agriculturist in this altered state of circumstances, will doubtless devote himself to the production of any article that promises an adequate return for his labour and capital. The advantages resulting from the growth of flax, as compared with other crops, will be treated of in a subsequent portion of these pages.

But a very general belief appears to prevail among our agriculturists, that flax is an exceedingly exhaustive crop. The opinion is one which has been handed down almost from time immemorial, and the clauses which in many cases are introduced into the agreements and leases for agricultural tenancies, forbidding the culture of flax, hemp, and woad, have no doubt tended to strengthen this conviction in the minds of those who have not possessed the opportunity of practically testing the truth of this very current opinion. It is most undoubtedly true that flax, in itself, like all other crops, whether cereal or others, is certainly an exhaustive one: few crops are, however, more exhausting than wheat; but the farmer does not refuse to grow it on that account, as he knows that a great proportion of the crop is usually returned to the soil. Now, there are two modes of testing the accuracy of the opinion with respect to the injurious effects of the flax crop, viz., by chemical analysis of the constituents of the plant, and by that still more satisfactory and convincing test—the result of practical experience. Tried by either or both of these, it will be found, under a judicious mode of treatment, analogous to that pursued by the grower with respect to his other crops, that flax, so far from being an injurious, will be found, independently of its other advantages, to be of greater value than any other crop in keeping the land in a profitable state of productiveness, and preventing the possibility of its deterioration.

If the construction of the plant be closely examined, it will be found that those portions of it which absorb the alkalies, and the nutritive properties of the soil, are those which are not required for the purpose of manufacture, viz., the woody part of the plant, the resinous matter, and the seed. The capsules of the seeds, the husks of the capsules, and the seeds, contain a very large proportion of nitrogen and phosphoric acid, and may consequently be advantageously employed for the purposes of manure or for the feeding of cattle. The fibre of the plant, which is that portion required for manufacture, consists of about 47 parts of carbon in 100, united to the elements of water—in fact, oxygen, hydrogen, and carbon are its principal constituent parts, and they are derived not from the soil but from the atmosphere. 100 lbs. of flax fibre has been found by recent experiments to contain not

more upon an average than 2 lbs. of mineral matters, including lime, magnesia, oxide of iron, carbonic, phosphoric, and sulphuric acid, and silica.

In cases where in the course of preparation of the flax, the seed and the whole of those portions of the plant which have absorbed the nutritive matters from the soil, are destroyed by steeping, and where nothing is left to be returned to the soil, there can be no doubt that the crop is an exceedingly exhaustive one; and in the present advanced state of agriculture, it would be a vain and absurd attempt to endeavour to induce the farmer to grow flax upon such conditions. The last report of the Royal Irish Flax Society gives some particulars of the flax crops of fifty-one farmers in the county of Down, not one of whom saved the seed; and although the average gain was £7 1s. 4½d. per acre, their example is one which is not likely to be very generally followed by enlightened agriculturists.

But apart from the deductions of chemical science, or theories founded upon the structure of the plant, the recent proceedings of the Royal Agricultural Society have completely set the question at rest. Mr. Beale Brown, who has devoted the last seven years to the culture and preparation of flax in the county of Gloucester, stated at the meeting of the society on the 26th of February, that flax, deriving as it did, a large amount of its nutriment from the atmosphere, was the least exhausting crop that could be put into the ground, provided the manure from the seed and refuse were retained on the land, and only the flax fibre itself carried off; and he had reason to believe that this opinion was now entertained by all parties connected practically with the cultivation of the flax crop.

Mr. Druce of Ensham in Oxfordshire, also stated that flax was not an exhaustive crop; that he grew turnips in the same year on his flax land without manure, and that his son had found that some wheat sown after flax, was one of the best crops he had ever grown. In Somersetshire it is a standing proverb that "good wheat crops always follow flax." Lord Monteagle also gave the result of his own experience, in connection with the growth of flax upon his land in Ireland, and said that some of the land which he had sown with it, had been previously rather exhausted, but by cultivating the crop well, that land had become better than any other on his estate; no meadow indeed, yielded such capital grass as that on which the flax had been grown.

The opinions of Sir Richard A. O'Donnell, one of the largest flax-growers in Ireland, and of Mr. Warnes, who has paid great attention to the subject in the county of Norfolk, were also stated in a



paper read before the society by Mr. Edward M'Dermott, a copy of which will be found at page 22.

A third great obstacle which has hitherto stood in the way of an extended cultivation of flax, has been the great trouble and annoyance to which the farmer was compelled to submit, in order to prepare his produce for market. The Royal Irish Flax Society has laboured strenuously to encourage and promote improvements in the various processes connected with steeping flax. It is unnecessary here to refer to the various modes hitherto adopted, and now recommended, or the imperfections and difficulties which they present to the grower, as the reader will find them very clearly stated in subsequent pages.

The reluctance and growing disinclination to cultivate flax even in Ireland, which is traceable, to a certain extent, to the difficulty connected with its preparation is most strikingly shown in the fact, that a society established in that country in 1841, for the purpose of promoting and encouraging the growth of flax, which numbers "among its members, the nobility and landed gentry on one hand, and on the other nearly all the individuals engaged in the spinning of yarn and manufacture of linen, with a considerable proportion of the wealthy English and Scotch flax spinners," which for the last three years has been backed by annual grants of the public money, and which has devoted "ten years of unremitting exertions" to the subject, has, so far from being enabled to accomplish the object for which it was formed, that it has not been able to arrest the decrease in the cultivation of flax in Ireland, from 83,000 acres in 1841, to 60,000 in 1849. This rapid decrease of flax culture has also taken place contemporaneously with an increase, unparalleled in the history of the linen manufactures, the raw materials to supply which have been obtained from the foreigner instead of the home producer. The *Morning Chronicle* has the following remarks with reference to this state of things:

"Perhaps the most remarkable feature connected with the cultivation of flax in this country is, that almost in the same proportion in which the demand for flax has increased, the supply has diminished. In 1757, before the first machinery for spinning flax was erected in Great Britain, Ireland consumed all the flax which she produced and imported from foreign countries, to the value of nearly £140,000. In 1816, during the existence of the Linen Board, Ireland, instead of being a flax-importing country, actually became an exporting country to the extent of £72,500. In the year 1841, there were in Ireland employed in the linen trade 41 mills, with 260,000 spindles; there are in the present year 73 mills, with 339,000 spindles, and adding the new mills now being built, and the additions of machinery now making to existing concerns, there will be by the end of this year about 400,000 spindles

in operation. Comparing the relative proportion of acres of flax grown with the number of spindles at work, it would appear that in 1841 the number of spindles was 3.1 times greater than the number of acres of flax, whereas in 1849, they were about 5.6 times greater. The cultivation of flax has fallen off in Ireland since 1841, nearly 25,000 acres, while the quantity grown in 1849, did not amount to one-half of that grown in 1844."

The Royal Flax Society has done all in its power to produce a different result. Every improvement in the mode of steeping, or in the after-treatment of flax, has received some share of its attention; and directions of the simplest and plainest character have been widely distributed over the country, for the purpose of enabling the grower to avail himself of the advantages which they offered.

The society has also, with the most ready zeal, come forward upon the bare announcement of any plan, by which the grower could be relieved from this obnoxious process, and which it conceived was, therefore, calculated to mislead the public, and denounced the ignorance and folly of those who supported it. Indeed, so great has been the vigilance and care exercised by the society, that their condemnation has, in several instances, preceded investigation. At a meeting of the County of Cork Flax Association, the subject of a new mode of preparing flax, by which the grower would be spared the trouble of steeping, was referred to by one of the speakers, when Professor Murphy, who attended on the part of the parent society, said, that "the Flax Society had reported against the process, and were then going to investigate the matter." Despite all these laudable exertions, however, the cultivation of flax has greatly fallen off, and, instead of that lively interest which it would have been desirable to have seen displayed on the subject by the cultivators of land in Ireland, there appeared, up to a very recent period, when the probability was announced of new markets being opened for the produce, a determination on the part of some of the principal growers, to discontinue altogether the growth of flax. This feeling of apathy on the subject is not confined to the growers of flax merely; but it is also to be regretted that, even among the supporters of a society calculated to be of such great service to the country, the same feeling very generally prevails, as is evidenced by the fact of the decrease in the amount of the subscriptions and donations, during the last as compared with previous years. Although many instances might be quoted to shew, that considerable profit and advantage would result to the grower from the preparation of his flax by the ordinary mode of steeping, still the great inconvenience and trouble attendant upon the process would prevent that general



cultivation of the crop which it would be desirable to witness in order to secure for our agriculturists and manufacturers that amount of independence of foreign countries for the supply of the raw material which they do not at present possess. It is vain to expect any increased cultivation of flax while such a state of things exists as that described by M. Payen, the celebrated French chemist, who was last year sent over by the French Government to report upon the subject of flax-cultivation in Ireland. "While personally inspecting," says that gentleman in his report to the Government, "from the 15th to the 20th of Sept., the flax fields in Ireland, I found all the inconvenience of the old system of management in a high degree of intensity, in the serious inconveniences of the watering in stagnant pools and of the spreading of the putrid products of this most disagreeable operation, diffusing abroad insupportable exhalations." It will be shewn presently that by the use of machinery of a very simple and inexpensive character,\* that the grower of flax may be spared all this inconvenience, and be enabled to send his produce to a certain and remunerative market, without the necessity of steeping it, and may also avoid those evils which, under the flax factorship system recently introduced into Ireland, have inflicted so much injury upon the flax cause, and discouraged many of the warmest of its friends in that country.

But a fourth reason, why notwithstanding the profitable nature of the crop, flax has been grown to so small an extent, is to be found in the uncertainty of the market which has hitherto existed for the article. Several striking instances are given of this in the report of the proceedings before the Royal Agricultural Society already referred to. Lord Monteaigle, who attended the meeting as one of the members of a deputation from the Royal Irish Flax Society, in referring to his endeavours to cultivate flax on his home farm as well as upon those of his tenantry in the south of Ireland, said,

"He had been induced, more to restore the growth of flax in that part of Ireland than to introduce it, as the cultivation had ceased on account of the want of markets for the produce. His tenants, too, were induced to join in the cause, as well as Lord Devon and other influential landowners of the district. They all succeeded, grew good flax, and the specimens received the favourable notice of the Flax Society, his lordship's sample being valued at £63 only at that time on account of the lowness of prices, but which would now fetch £100. His tenants did not, however, succeed so well as himself; they could not transport the flax in its bulk, they had no water-power, and he was unwilling to erect steam-power till assured of a market; the

\* This machine may be seen at 26, Gresham-street, London

consequence was, that he had to take all the flax off the hands of his tenants, so that at that time he had more stacks of flax than of wheat on his farm, with no means of turning them to account."

Several other growers of flax in England made similar complaints. Mr. Hammond of Norfolk, said, that not finding any market, he had thatched several of his cottages with the straw, and a more beautiful thatch he never saw. Mr. Fuller, M.P. had also grown flax in Sussex, but had "no better success in getting it off his hands; and when he offered it to a large manufacturing house, he was told they could only give him linen in return for it." At a subsequent meeting of the Agricultural Society, on the 12th of March, Mr. Fuller laid before it his balance sheet of the cultivation of flax, from which it appears that he had succeeded in selling his flax in the straw—the produce of one acre—for three pounds; and that his profits, upon the one acre, was £8 6s. 0d. The value of the seed alone—24 bushels, at 8s. a bushel—being £9 12s. 0d. Mr. Shelley also stated that in Sussex it could not be turned into money, there was no difficulty in farmers growing flax, the only difficulty being to get a market for it; if it could be made a marketable article, there would be no want of growers.

#### DISTINGUISHING FEATURES OF THE PRESENT FLAX GROWING MOVEMENT.

Having noticed the present depressed state of flax-culture in the United Kingdom, and some of the causes which have led thereto, I proceed to notice that altered state of circumstances which gives its peculiar and distinguishing character to the present movement. This consists in the opening up of new and extensive markets for flax, consequent upon the discovery that it can be advantageously employed in every branch of the textile manufactures of the country, and that its preparation is now so far simplified, as to enable the grower to obtain a ready and remunerative market in any form in which he may prefer to dispose of his crop. Of the extent and character of the new markets now open to the flax-growers of the United Kingdom, and which are not yet possessed by the foreign producers, it is unnecessary to say more, than that one half of the present demand for cotton may be advantageously supplied by home-grown flax. This subject is gone into more fully at page 24. The importance and value to the landed and agricultural interests of this new demand for an article which may be profitably produced by them, was referred to by Sir James Graham, in the House of Commons, in the debate on agricultural distress, on the 13th of February. The



right Hon. Baronet had been present the previous day at the meeting of the Council of the Royal Agricultural Society, and evinced the greatest interest in the discussion which there took place, on the general question of flax-cultivation, and the recent discovery by which flax could be made available for spinning, alone or in combination with cotton, wool, or silk, upon the existing machinery. In reply to the hon. member for Carlisle (Mr. Hodgson), who had referred, among other matters, to the condition of the hand-loom weavers in the town which he represented, Sir James Graham having referred to the effect which the diminished supply and increased price of cotton had had upon the prospects of that class in that particular locality, said—

“But this is a question of the price of cotton, and strange as it may be, it opens out a ray of hope even to the landed interest. Whence does this ray come? Why, it comes from the quarter whence they least expected it:—

———“Via prima salutis,  
Quod minime reris, Graia pandetur ab urbe.”

It is from the mills of Messrs. Bright and Co. (cheers and laughter). It is from Rochdale that this light of hope opens on the landed interest (cheers). Hopes are entertained—confident hopes—that by a new management of flax-stalk it may be used in large proportions with great advantage and diminution of cost in mixture with cotton wool, sheep's wool, and even with silk wool (hear, hear). And, Sir, for my part, I cannot conceive any dispensation of Providence more merciful, than that science and skill should succeed in overcoming this difficulty, whereby we should be rendered in a great degree independent of foreign supply, while a great stimulus would be given to our manufactures; and if, happily, this encouragement to the cultivation of flax here should succeed, I am very confident we shall hear no more of the distress of those hand-loom weavers, that the cultivation of land will be largely improved by the introduction of capital in growing this new plant, and that this plant will be of great service to the agriculturist, from its being peculiarly adapted to increase the fertility of the soil” (cheers).

The facilities with which the grower of flax will be enabled to avail himself of these new markets, constitute the second great feature in the present flax movement. The difficulty of disposing of his produce, unless previously prepared by steeping, as already shown, has hitherto formed a serious obstacle to the extension of flax culture. In order to remove the objections of the growers on this head, the system which exists in Belgium of purchasing the flax in the straw by factors, was a few years since introduced into Ireland, at the recommendation of the Royal Irish Flax Society; but in the last report of that society, it is stated, that there was “reason to believe that the system could not be made practically

available in that country." Aware of the many difficulties which existed in the way of the grower preparing his flax for market, it being considered indispensable that the first stage in its preparation should involve the necessity of steeping; finding also that the plan of purchasing the flax in the straw by factors would not be practically available, it has been proposed, that persons possessed of exclusive rights, under a patented system of steeping the flax in hot water, and which, undoubtedly, possesses many advantages over the old modes of steeping, should in the particular districts secured to them, purchase the flax from the grower, and relieve him altogether from the trouble and risk of its preparation for the manufacturer.

The principle of "division of labour," upon which this new arrangement purports to be founded, is perfectly sound, and it is one which is everywhere recognised as the great agent in the race of competition. Let a man's undivided attention be devoted to any particular trade or department of industry, and the work will, undoubtedly, be much better performed than by the person only casually employed in the production or manufacture of the same description of article. To this general rule the preparation of flax for manufacturing purposes forms no exception.

This principle of a division of labour which may be invaluable where competition exists, may, however, become the means of the greatest oppression and injustice, when not subject to the check which a wholesome competition provides. It is the complete absence of this salutary check that renders the plan proposed by the Royal Flax Society open to objection and liable to the worst of abuses. A mere division of labour, without fair competition, may be compared, in its effects, only to a dead and stagnant pool, rather than an onward living stream which should be the type of a great branch of national industry. By the plan as at present proposed, the growers of flax in large districts of country have no means of disposing of their produce except to the party possessing a license under the patentee for their particular district. They are thus placed entirely at the mercy of an individual who, in the profit resulting from this division of labour will naturally be anxious to obtain the lion's share; and it is not in human nature successfully to resist the temptations which unlimited power confers. It appears, from statements made before the Royal Agricultural Society, and which were not impugned by the representatives of the Royal Flax Society present on the occasion, that this power has already been injuriously exercised to a considerable extent, and prices have been offered for crops of good and fair character, which, in many instances, would not repay the cost of cultivation.



The *Morning Chronicle*, alluding to this subject, a short time since, made the following remarks:—

“ Under a system which involves the supposed necessity of steeping the flax in one form or other, it is obvious, from the risk and trouble which must be incurred, that it is only by the general establishment of some such principle as this of ‘division of labour,’ that any very extended growth of flax can be reasonably anticipated. It is a matter, however, worthy of very grave consideration, how far some plan may be devised which will give a more equitable division of labour than that above indicated, with it some more equitable distribution of profits, and which will also enable the grower of flax to avail himself of the advantages which competition ought always to afford in any system of ‘division of labour.’ ”

The remedy for this state of things is a perfectly simple one, and consists merely in placing at the disposal of the grower, the means of reducing the bulk of his flax crop without resorting to steeping, so as to admit of its easy and convenient transit to the best and most advantageous market. The grower of flax will not then be compelled to dispose of his produce upon the terms which may be offered by an individual, possessing the exclusive right of preparation under any system, but may avail himself of the facilities which the great extension of the railway system provides for sending his crop, reduced both in weight and bulk, to any market where better prices may be obtained. I am as deeply interested as any person in upholding the rights of inventors, and of persons holding licenses under them; but I protest I would infinitely rather prefer sacrificing my own interest in the matter, and throwing open my invention to the public, than consent to derive advantages obtained at the expense of a class of producers, for whose prosperity I have from my youth felt the deepest interest, and in whose pursuit and employments, many of the happiest years of my life have been passed.

That a reduction of the bulk, by a partial separation of the straw from the stem of the flax plant, may be effected without steeping, and by a very simple and inexpensive mechanical process, is a point which is now completely set at rest. All that is required, is simply to pass the stem between a pair of rollers, or break it by means of a common “breaker,” after which the straw may be separated by any beating motion with the most perfect ease. The cost of a hand-machine for this purpose would be about ten pounds, and may be used without payment for license or royalty, by any grower of flax in the United Kingdom. The flax so prepared, according to the Report of the Royal Flax Society, is peculiarly well adapted to the manufacture of sail-cloths, standing and running rigging, ropes,

canvass, nets, bags, and other coarse articles for manufacture. It is also excellently adapted for the after-treatment required in order to prepare it for spinning, alone or combined with cotton, silk, or wool, upon the ordinary machinery. In addition to these large and important markets, it is also equally available for the great and growing branch of the linen manufactures, for which it is considered necessary that the flax should be steeped, either in cold or hot water, previous to being spun. Mr. M'Adam, the Secretary of the Royal Flax Society, when shown at the meeting of the Royal Agricultural Society some samples of the flax thus partially cleaned without steeping, expressed his belief that considerable advantages would be derived from such a complete or partial separation of the straw or woody part of the plant, previous to steeping.

The two great advantages which would be gained from the treatment of the flax in this state, as compared with the present mode of steeping it while in the straw, would be the greater quantity which it would be possible to put into the steep-vats, and a considerable reduction of the period at present required for steeping. It is estimated that by the time when this year's flax crop reaches maturity in Ireland, there will be upwards of twenty of Schenck's steeping concerns ready for work, capable of preparing the produce of 6,000 acres, or about one-tenth of the average breadth of flax at present cultivated in that country. It is evident that if so much of the straw were taken from the plant, as would reduce its bulk to one-fourth the accommodation at present provided would be sufficient for steeping the produce of nearly 20,000, instead of 6,000 acres. And if the period required to steep the flax were reduced in a similar proportion, in consequence of the greater ease with which the action of the water could be brought to bear upon the fibres, the vats at present erected would be more than sufficient for the preparation of the whole of the flax at present grown in the United Kingdom, and the cost of the plant and buildings required for future steeping concerns, would be greatly diminished.

In addition to the advantages which the grower would derive from this partial removal of the straw and diminution of the bulk of his crop, by being enabled to avail himself of the best market for his produce, he would also be enabled to return to the soil, in the shape of manure, a large portion of the crop which would otherwise be lost to it. Thus, for instance, a grower having four tons of flax in the straw, would by the separation of the straw by a purely mechanical process, obtain from two to three tons of a material of equal if not of greater value than wheat straw, which would be available for mixing with linseed



or other articles of cattle-food, and thus increase the quantity and value of the manure. He would also have the means of profitably providing more constant and steady employment for his labourers, as such preparation of the flax might be carried on at times when the state of the weather or other circumstances rendered field labour impracticable.

#### DIVISION OF LABOUR.

But although the principle of a division of labour may be absolutely necessary, in order to attain perfection in the preparation of flax, or manufacture of any article, it is by no means necessary that the different portions of the labour should be carried on by parties each having conflicting and independent interests to serve. That division of labour which allots certain duties to the ploughman, the sower and the reaper, does not necessarily involve the idea of conflicting interests, such as that which has been pointed out in the relation in which the grower stands to the steeper or preparer of flax. There is no reason whatever, now that the mode of treatment required in the preparation of flax has been made one of comparative ease and perfect certainty; and if an adequate profit can be derived from the operation, why, the grower should not carry out upon his own farm, one step farther the great principle of "division of labour," which he has employed in the production of his crop, in order to bring it into a state ready for use by the manufacturer. The objections which existed to such a course under the old modes of preparing and steeping flax, are now completely removed. Great improvements are constantly taking place in the mode of carrying on farming operations; agriculture is rapidly becoming a science; and the scientific agriculturist of the present day cheerfully avails himself of every assistance which the discoveries of chemistry or the development of mechanical skill can afford. The tall chimneys which already begin to dot the face of the rural districts, show that the steam engine is already recognised as an agent, and its mighty power made to subserve the interests and do the bidding of its agricultural masters.

Why should not the same principle of "division of labour" which has allotted his duties to the "engine man," upon the farm, be extended so as to include the "preparer of the flax?" The same power which propels the varied thrashing and cutting machines, could be applied to machinery of an equally simple character for the preparation of the flax. To object to the agriculturist of the present day engaging in these operations, because to his other knowledge he has not added that of a chemist, would be as impertinent as to contend that he ought not to be allowed the use of steam machinery, because he has not the know-

ledge and experience of an engineer. The amount of chemical knowledge required in the preparation of flax, according to the new modes is, however, really so small that any agricultural labourer of average understanding, may acquire it in less than twenty-four hours. The great want of the present age is the means of bringing more closely together the great agricultural and manufacturing interests of the country. The estrangement of feeling between these two great classes, has already subsisted too long, and been productive of too many evils to render its further continuance desirable; and there are no means by which this feeling can be more effectually overcome, than by bringing them into closer alliance with each other in the character of producer and consumer.

There are many agriculturists, however, not possessed of steam machinery and who could not grow such a quantity of flax as would make it profitable for them individually to erect the necessary buildings and apparatus required in the complete preparation of their produce, for the cotton or linen manufacturer. In such cases, the principle of mutual co-operation at once suggests the means by which the object might be obtained. The flax growers in certain districts might unite together, for the purpose of providing the necessary plant and buildings, and thus secure to themselves that large amount of profit to be derived from the complete preparation of the flax fibre. They might in one and the same building, provide the means of crushing the oil from their surplus linseed, and prepare their flax for the cotton, linen, wool, or silk manufacturer, as best suited their purpose; for the same apparatus which would be required for the preparation of the long flax for linen, would be equally applicable for the production of the short fibre, suited to the other branches of manufacture. According to the statements which have been put forward by the Royal Flax Society, of the produce and cost of preparing the flax under Schenck's system, it would appear that a gross profit could be obtained from one acre of flax of about 23%, or something like 200 per cent. The sanguine expectations formed on the subject have not been, however, completely realised in practice, and, instead of obtaining one-fifth of fibre, the average does not exceed one-eighth. But even with this diminished yield, however, the preparation of flax upon this system may be carried on "with a fair profit to those who may embark in it as a business undertaking."

The profits to be obtained from the preparation of flax-cotton—which can be made of any required staple—of flax-silk or flax-wool suited to existing machinery, are such as to offer the greatest inducements for persons to embark upon the undertaking, as shewn in the following estimate of the cost of production and value of the article:—



|                                                        |       |   |   |
|--------------------------------------------------------|-------|---|---|
| 6 tons of flax in the straw at £4 per ton, or,         |       |   |   |
| 2 tons of flax partially cleaned by the grower, at say |       |   |   |
| £12 per ton .....                                      | £24   | 0 | 0 |
| Ingredients employed .....                             | 5     | 0 | 0 |
| Cost of labour .....                                   | 6     | 0 | 0 |
|                                                        | <hr/> |   |   |
|                                                        | £35   | 0 | 0 |

Being about fourpence per pound.

This estimate cannot, by any possibility, be exceeded; and is considerably higher than the results of actual experiments have shown to be the case. The produce of six tons is stated to be required, whereas five tons of a fair quality would be amply sufficient. The cost is also stated at £4 per ton, while the average price at present paid for flax in the straw does not exceed £3 per ton. The cost of ingredients and labour is set down as the same required under Schenck's process, but which exceeds the actual cost, especially in Ireland. The value of the flax so prepared will be regulated, to some extent, by the price which its rival, cotton, bears in the market: but there is no doubt but that it will range at prices equal to that of "fair bowed," at present about eight pence per pound, the *Manchester Examiner and Times* states that the flax so prepared is "perfectly white and clean, superior indeed, as respects colour, to any cotton we have seen." In addition to this it will be seen there will be a great saving in loss or waste, as compared with cotton; because when the flax enters the blower it will have been already thoroughly cleaned, and cannot lose anything in the process of working beyond some of the finest and lightest fibres." Taking it however as worth only six-pence per pound, the value of one ton will be £56, while its greatest cost as shown by the above estimate will not exceed £35, leaving a gross profit of £21 per ton upon its preparation. The same estimate would apply to the preparation of flax for spinning upon wool and silk machinery.

The report of the proceedings of the Agricultural Society states the advantages connected with this mode of preparing flax to be the following:—

"That by the new process flax is rendered capable of being spun, either in whole or in part, on any existing spinning machinery.

"That the fibre to be mixed with cotton or spun alone on cotton machinery is so completely assimilated in its character to that of cotton, that it is capable of receiving the same rich opaque colour that characterises all dyed cotton; and, consequently, any cloth made from flax-cotton yarn can be readily printed, dyed, or bleached, by the ordinary cotton processes.

"That flax-fibre can be always produced with profit to the British

\* See Appendix. page 44.

grower at a less price than cotton can be imported into this country with profit to the foreign producer.

"That, as a consequence of this advantage, the manufacturers of this country will be less dependent on the fluctuations of the cotton crop for a supply of the raw material, and a more regular employment will be given to the manufacturing population, and the present amount of local rates be greatly diminished thereby.

"That the British grower will of necessity derive great benefit from the supply of the wide demand thus opened to him.

"That with respect to the advantages of being able to spin flax in combination with wool on the existing woollen machinery, the first is, that the flax prepared by M. Claussen is capable of being 'scribbled,' 'spun,' 'woven,' and 'milled,' in all respects as if it were entirely wool; having an advantage in this respect over cotton, which has not the slightest milling properties; on the contrary the flax fibre is capable of being even made into common felt hats with or without an admixture of wool. To such an extent has the milling property of flax been proved, that the sample of cloth exhibited had been woven to 54 inches wide, and milled up to 28 inches wide.

"That the flax-fibre will not, under any circumstances, when prepared for spinning with wool, cost more than from 6*d.* to 8*d.* per lb., while the wool with which it may be mixed will cost from 2*s.* to 4*s.* per lb.; consequently reducing the price of cloth produced from this mixture 25 or 30 per cent. below the present prices of cloth made wholly from wool, and being of equal, if not greater durability.

"That short-wool refuse, which cannot by itself be spun into a thread may, by being mixed with this thread, be readily spun and manufactured into serviceable cloths.

"That there is a probability of a further demand being opened up for this fibre in the flannel and woollen trade,

"That by this process flax may be also so prepared as to be spun in any certain proportions with silk upon the existing silk machinery; that when so spun, it is capable of receiving considerable brilliancy of tint. That the fibre may be prepared for thus spinning at a uniform price of from 6*d.* to 8*d.* per lb. That as it may be spun in any proportion with silk, it is evident that the price of the yarns must be reduced according to the relative proportions of the materials employed, thus extending the markets, and giving increased employment to the operatives.

"That, by M. Claussen's plan of bleaching, any useless flax can be converted into a first-rate article for the paper-maker, at a less price than the paper-maker is now paying for white rags; and suitable for the manufacture of first-class papers."

It may, probably, be considered presumptuous in me to offer an opinion on the value of an invention with which I am personally connected, but it appears to me impossible to estimate too highly the beneficial effects which the opening up of new markets,



so extensive as those of the manufactures of Great Britain, will have upon the development of the vast industrial resources of Ireland. It would tend to arrest that fearful tide of emigration which is now sweeping away the bone and sinew of the country, and adding power and strength to a haughty rival, upon whom England is dependent for its prosperity and even its manufacturing existence. By giving the means of profitable employment to the people, the crushing burden of local rates would be diminished, land would realize its fair value, and we should hear less of the "confiscation" of the property of the country, through the machinery of the Encumbered Estates' Court. A firm bond of union would be formed between the two countries, while agricultural science and mechanical skill, working hand in hand, would fix the prosperity of the country upon a basis firm as the sea-girt isle itself. The slender stalks of the flax plant waving over its broad and fertile lands, would render our agriculturists and manufacturers independent of foreign countries, and its beautiful and delicate blue flower would henceforth be regarded as the emblem of a happy united and prosperous people.

#### PREPARATION OF FLAX COTTON.

The principle of the invention by which flax is adapted for spinning upon cotton, wool, and silk, independent of flax machinery, consists in destroying the cylindrical or tubular character of the fibre, by means of carbonic or other gas, the action of which splits the tubes into a number of ribbon-like filaments, solid in character and of a gravity less than cotton, the upper and under surfaces of which are segments of circles, and the sides of which are ragged and serrated. In order to explain the nature of the process by which this change is effected, it is necessary first to explain the structure of the flax plant. The stem of the plant consists of three parts; the shove or wood, the pure fibre, and the gum resin or glutinous matter which causes the fibres to adhere together. In the preparation of the plant for any purpose of fine manufacture, it is necessary first to separate from the pure fibre both the woody part and the glutinous substance. The former of these may be removed by mechanical means, previously referred to, almost as simple as those employed in the threshing of wheat. In order, however, to remove the glutinous substance from the fibre, recourse must be had either to the fermentation produced in the steeping process or to some other chemical agent. The present system of steeping in water, whether cold or hot, is, however, ineffectual for the complete removal of the glutinous substances adhering to the fibres, a large per centage of which is insoluble in water. The first

process, therefore, which it is necessary to adopt in the preparation of flax cotton, is to obtain a perfect and complete disintegration of the fibres from each other, by the entire removal of the substance which binds them together.

This is effected by boiling the flax for about three hours, either in the state in which it comes from the field, or in a partially cleaned condition, in water containing about one half per cent of caustic soda. After undergoing this process, the flax is placed in water, slightly acidulated with sulphuric acid; the proportions of acid used being 1 to 500 of water. Any objections urged against the employment of such substances, even in the small proportions above stated, are at once met by the fact, that the soda present in the straw, after the first process, neutralizes the whole of the acid, and forms a neutral salt, known as sulphate of soda. This process producing, as it does, a complete separation of the integral fibres from each other is equally adapted for the preparation of long fibre for the linen, or of short fibre for the other branches of textile manufacture. When required to be prepared for linen, all that is necessary after the above process, is to dry and scutch it in the ordinary modes. The advantages which this mode of preparation possesses over any other mode in use, are stated in the official report of the proceedings at the Royal Agricultural Society to be the following:—

1. "That the preparation of long fibre for scutching is effected in less than one day, and is always uniform in strength, and entirely free from colour, much facilitating the after-process of bleaching, either in yarns or in cloth.

2. "That it can be also bleached in the straw at very little additional expense of time or money.

3. "That the former tedious and uncertain modes of steeping are superseded by one perfectly certain with ordinary care.

4. "That in consequence of a more complete severance of the fibres from each other, and also from the bark and boon, the process of scutching is effected with half the labour usually employed."

Complete, however, as may be the separation produced by this mode of treatment, the fibres, from their tubular and cylindrical character, are still adapted only for the linen or present flax manufactures, as their comparatively harsh and elastic character unfits them for spinning on the ordinary cotton or woollen machinery. At this stage, therefore, it is that the most important part of the invention is brought into operation. The flax, either before or after undergoing the processes required for the severance of the fibres, is cut by a suitable machine into the required lengths, and saturated in a solution of sesqui-carbonate of soda (common soda) a sufficient length of time to allow of the



liquid entering into and permeating by capillary attraction every part of the small tubes. When sufficiently saturated, the fibres are taken out, immersed in a solution of dilute sulphuric acid of the strength of about one part to two hundred parts of water. The action of the acid on the soda contained in the tube, liberates the carbonic gas which it contains; the expansive power of which causes the fibres to split, and produces the result above described. The fibre is then bleached, and after having been dried, and carded in the same manner as cotton, is fit for being spun upon the ordinary cotton or woollen machinery; the material at this stage possessing the qualities described in the *Manchester Examiner* and *Times*, and to which allusion has already been made. The practicability of transforming flax into this cotton-like substance, was demonstrated at the last meeting of the Royal Agricultural Society, by Professor Way, the consulting chemist to the Society, and the Secretary, Mr. Hudson, referring, in his report of the proceedings, to the experiment which then took place, says:—

“Although we have long been practically familiar with the expansive effects of aeriform fluids suddenly disengaged chemically from an apparently solid and inert substance like gunpowder, either in fire-arms or the blasting of rocks, and with their elastic recoil when released from the pressure of condensation, as in the air-gun or the liquid gases of Dr. Faraday, we were not prepared for so beautiful an instance of the application of this principle as the one Chevalier Claussen has given us in the splitting of vegetable fibre, by conveying into its interstices the carbonic acid gas concealed in condensation and chemical alliance with soda, and then setting it free by the addition of acid, which breaks off that alliance by its own superior elective affinity for the alkali. Means shown in their result to be so powerful, and in their operation so gentle yet decisive, gave to the simple experiment, made in the presence of the council by Professor Way, more the air of a new instance of natural magic, than the sober reality of an ordinary operation of natural laws, of which the application only was novel; and its effect on the meeting was accordingly both singular and striking, occasioning evident marks of their agreeable surprise and admiration at the result obtained. The flax fibre soaked in the solution of sub-carbonate of soda was no sooner immersed in the vessel containing the acidulated water, than its character became at once changed, from that of a damp rigid aggregation of flax to a light expansive mass of cottony texture, increasing in size like leavening dough, or an expanding sponge. The change was no less striking when this converted mass in its turn was placed in the next vessel, which contained the hypo-chlorite of magnesia and became at once bleached, attaining then the colour as it had just before received the texture, of cotton.”

Some objections have been taken to this process by persons

who appear to regard flax as a material which ought to be solely applied to the manufacture of linen or cambric, and think that any preparation of it which does not best adapt it to the manufacture of these fabrics, is to be discountenanced. The attempt to substitute flax for cotton—a home-grown for a foreign article—has even been stigmatized as a *reductio ad absurdum*, by an extensive flax grower and manufacturer of Belgium, in a letter published in the *Morning Chronicle*, and who also expressed his opinion, that any invention by which cotton could be transformed into flax, would be justly entitled to the merit of a great discovery.

The objection is founded upon the supposition, that the fibre is greatly reduced in strength by the process resorted to. When compared with fibre of an equal degree of fineness, prepared upon the most improved method of steeping, the results have been decidedly in favour of the mode just described. When the fibres, however, are split, it is perfectly natural to suppose, inasmuch as “a part is less than the whole,” that the filaments into which they are split, are not of the same strength as the fibres of which they originally formed a part. The strength of the fibre is reduced in proportion to the division of the parts which takes place, and is not impaired by the action of any of the chemical ingredients employed. The strength of the fibre, when brought into a fit state for the cotton-spinner, is not, therefore, to be compared with that required for the stronger and more durable linen yarns, but with that for which it is intended to be used as a substitute or auxiliary; viz. cotton or wool, with which it will bear the closest comparison. It matters, therefore, little by what name the fabric produced from the prepared flax-fibre or flax-cotton be called, provided it open up a demand for flax at remunerative prices to the grower. That the material so prepared, is capable of being spun on cotton and wool machinery, is a fact, with respect to which any person may satisfy himself, by visiting the mill of Messrs. Quitzow, Schlessinger and Co., at Apperley-bridge, near Bradford, and at Mr. Dargan's mills at Kildinan, near Cork, where the process is now being carried on upon an extensive scale. The objection with respect to the cost of preparation has been disposed of in the preceding chapter.

The *Manchester Examiner and Times*, in its account of the experiment lately carried on at the mill of Messrs. Bright Brothers, of Rochdale, stated some weeks since, that—

“The rovings thus produced have been made both into mule and throstle yarn, the former being about 30s. weft. and the latter about 18s. twist. We have seen samples of the weft and twist thus spun, and although it might not take a first place in the market, it is such as to afford satisfactory evidence that yarn and cloth of fair quality may be, and probably soon will be, made of equal parts of flax and cotton.”



Samples of the cloth referred to above, which were woven at the mill of Messrs. Bright Brothers, of Rochdale, were exhibited at the meeting of the Royal Agricultural Society, on the 26th of Feb., as well as of the following articles as contained in the official report of the proceedings:—

“Sample of flax-straw, prepared according to the new process, adapted for linen manufactures.

“Sample of long fibre scutched from the above.

“Samples of pure flax-fibre, or “British cotton,” adapted for spinning on cotton machinery.

“Sample of yarn spun on cotton machinery, some from all above flax-fibre, others mixed in various proportions with American cotton, those mixtures being termed by the inventor flax-cotton.

“Samples of flax-fibre prepared for mixing with wool.

“Samples of yarn produced on ordinary woollen machinery, composed of wool and flax in various proportions, termed by the inventor flax-wool.

“Samples of flannel woven from the above.

“Samples of fine cloth woven from yarn composed of flax and fine wool in various proportions, and dyed.

“Flax-fibre prepared for mixing with silk, and dyed of various colours.

“Flax-fibre mixed with spun silk, and termed by the inventor flax-silk.

“A sample of yarn produced from the above.

“Samples of flax-cotton yarn dyed of various colours.

“Samples of cloth woven from flax-cotton yarn and wool, dyed.”

In order to afford every possible facility to the growers of flax, either in their individual capacity or by means of associations among themselves, for the preparation of flax cotton, the inventor instead of requiring a considerable sum to be paid down for the grant of licenses to use his invention, is prepared to grant a license for twelve months, for a moderate sum, leaving it optional with the party to renew the license at the expiration of that period upon the same terms, and will undertake to receive for royalty a certain quantity of the prepared flax cotton at the rate of 6*d.* per pound. The necessary instructions will also be *practically* given in all cases where required, or properly qualified persons will be provided for superintending the processes to be adopted. With respect to persons disposed to grow flax, but who would not be induced to avail themselves of the advantages which would result from the complete preparation of the fibre, and who, from their distance from a market could not profitably dispose of their produce in the straw, the inventor will undertake to supply at cost price,—about 10*l.*—without payment for license, royalty, or other charge, suitable machines for enabling the grower to reduce the bulk of his crop, and to diminish thereby the cost of transit to suitable markets.

Should the grower of flax not be disposed, however, to undertake

the complete preparation of his produce for the manufacturer, and the existence of markets in his immediate neighbourhood for the flax in the straw, should render it unnecessary for him to reduce its bulk, the sale of the flax in that state would be attended with profit greater than can be obtained from any ordinary crops, as shewn by the following statement, made by Mr. Druce, of Ensham, in Oxfordshire, before the Royal Agricultural Society. His property lay on the Oxford-clay formation, and the piece of ground on which his flax was grown consisted of a deep red loam, and in extent was 5a. 2r 36p. His profits were as follows:—

#### 1.—EXPENSES OF CULTIVATION.

|                                                 |    |    |    |
|-------------------------------------------------|----|----|----|
| One ploughing, at 10s. per acre .....           | £2 | 17 | 3  |
| Sowing and harrowing, at 1s. 6d. per acre ..... | 0  | 8  | 7  |
| Weeding, at 2s. per acre .....                  | 0  | 11 | 5  |
| Flax-seed, 13½ bushels, at 9s. ....             | 6  | 1  | 6  |
| Rent of land, at 48s. per acre .....            | 13 | 14 | 9  |
| Taxes, at 6s. per acre .....                    | 1  | 14 | 4  |
| Pulling flax, at 14s. per acre .....            | 4  | 0  | 1  |
| Carting and stacking, at 4s. per acre .....     | 1  | 2  | 10 |
| Thrashing .....                                 | 5  | 7  | 1  |
| Winnowing .....                                 | 0  | 12 | 6  |

Total Expenses ..... £36 10 4

#### 2.—SALE OF PRODUCE.

|                                                                   |     |    |   |
|-------------------------------------------------------------------|-----|----|---|
| Sale of flax seed, 20¼ bushels per acre—116¼ bushels, at 8s. .... | £46 | 10 | 0 |
| Sale of flax straw, 12 tons 2 cwt. 2 qrs., at 3l. per ton .....   | 36  | 7  | 6 |
| Sale of chaff, at 5s. per acre .....                              | 1   | 8  | 7 |

Total Receipts ..... £84 6 1

Leaving a net profit of 47l. 15s. 9d. on the 5a. 2r. 36p., being equal to 8l. 6s. 2d. per acre of land employed in this trial of flax cultivation.

Mr. Druce expressed his opinion, at all events, that it would be found a good thing for every farmer to grow some flax on his farm, if only for the purpose of working up his inferior hay, with a paste of beans and flax seed, as food for his cattle.

#### ARGUMENTS IN FAVOUR OF AN EXTENDED FLAX CULTURE.

In addition to the advantages already referred to, from an extension of flax-culture in the United Kingdom, many additional advantages and arguments in its favour are to be found in the official report of the proceedings at the meeting of the council of the Royal Agricultural Society, on the 13th of February, of which the following is an extract:—



# ROYAL AGRICULTURAL SOCIETY OF ENGLAND—CULTIVATION OF FLAX.

FLAX COTTON.—The Chairman informed the council, that in consequence of the great interest, in a national point of view, attached to the recent discoveries of M. Claussen in rendering flax subservient to the purposes of cotton, and the importance to the farmers of this country of every fact affecting the cultivation of flax, he had requested that gentleman to favour them with his attendance on that occasion, in order that he might explain to those members present his views on the subject of the increased demand that might possibly arise for the article of flax by the British manufacturer, in consequence of the facilities offered by his new process for adapting it to purposes of a more general character, and the greater attention the flax crop would deserve on the part of the agricultural community, reserving to a further meeting the opportunity of detailing to the council the chemical and mechanical processes by which flax was converted into a substance possessing for manufacturing purposes all the properties of foreign cotton. The Chairman hoped that this discovery, if found to be equal to the expectation formed of it, might, perhaps, constitute a new bond of union between the farmer and the manufacturer of this country. He need scarcely add the caution, that the council were not responsible for the opinions which might be laid before them on this subject, as their own rule, like that of other similar bodies, guarded them from any danger of misapprehension on that point. The statement of M. Claussen would rest on its own merits or otherwise, and they were obliged to that gentleman for favouring them with his views on the subject, at their first weekly council of the session, and previously to the final enrolment of his specifications.

Mr. M'Dermott on behalf of the Chevalier Claussen, then read the following paper:—

## REASONS IN FAVOUR OF AN EXTENDED CULTIVATION OF FLAX AND HEMP IN THE UNITED KINGDOM.

My object, gentlemen, in reading the present paper, at the request of your esteemed chairman, is to submit to you, and through you to the great agricultural body of England, a few facts bearing on the importance and advantage which, in a national and individual point of view, would result from a more extensive cultivation of fibrous plants in this country. In venturing humbly to submit these facts and opinions to so important and influential a body of gentlemen as those who compose the Council of the Royal Agricultural Society, I am far from wishing it to be understood either that I conceive them to be ignorant of many of the facts which I shall have occasion to adduce, or that the subject of flax culture is one to which they have not already paid some considerable attention. On the contrary, many of the valuable reports of your society, and the prizes given for essays on the subject, prove that it has at various times engrossed your consideration, and formed the

theme of serious deliberation at your councils. Markets comparatively undeveloped; ignorance of the true character and structure of the plant; prevalence of modes of cultivation and preparation of the fibre, wasteful and injurious in themselves, and attended with an enormous amount of risk and trouble to the grower, have hitherto each had their weight in inducing your society to withhold its valuable recommendation in favour of an extension of flax culture.

The progress of science, and the skill and enterprise displayed by many of the agriculturists of England and Ireland, have, however, now placed the matter upon a perfectly different footing, and upon one which I venture to submit should induce the Royal Agricultural Society, in the most strenuous manner, to urge upon the farmers of the United Kingdom the propriety of immediately devoting some portion of their land to the cultivation of flax.

**CLIMATE AND SOIL OF ENGLAND SUITED TO ITS GROWTH.**—That flax can be produced in this country is a point upon which I apprehend little doubt now exists; and it is unnecessary for me, especially before such a body as that which I have now the honour of addressing, to argue such a question. Suffice it, therefore, upon this point, to say, that in many respects our climate is better adapted for its growth than even Belgium, inasmuch as we are not subject to those severe droughts which, occurring in the spring, in that country, frequently inflict very serious damage upon the young crop. Flax is grown to some extent in almost every part of the United Kingdom; it has been grown with success upon an Irish bog, and in the fen districts of England, on the summit of the Wicklow mountains, and upon the Beacon-hill of Norfolk, in the midland counties of England, and the western shores of Galway and Mayo, upon rich and poor, clayey, gravelly, alluvial, and every variety of soil.

**IMPORTANCE ATTACHED TO GROWTH OF FLAX BY GOVERNMENTS.**—This suitability of our climate and soil to the production of flax, and the importance which in earlier times was attached to it, is sufficiently evidenced by the numerous legislative measures which at various times, from the reign of Henry VIII. to that of George III., have been passed in order to promote and encourage its growth. The "Transactions of the Board of Agriculture" for 1742, contain a letter, written by Robert Somerville, Esq., of the East Lothians, in which the writer regrets, notwithstanding these encouragements and the bounties offered by the liberality of the Government, that the cultivation of flax should then have been so extremely limited, and the management in every stage, both of its culture and manufacture, so very defective.

"This," says he, "is the more to be regretted, as there can be little doubt that immense quantities might be raised in Britain with little labour, and that, too, upon soils where hardly anything else will grow. The accomplishment of an object so truly desirable as that of the extended cultivation of flax would be attended with the most salutary effects, by affording employment for an increased population, and materially lessening our dependence upon foreign countries."



But if, upwards of a century since, great importance was attached to this subject, on the ground of increased population and dependence on foreign countries, of how much greater importance and advantage ought it not to be considered, at a time when our population is more than doubled, and our consumption of cattle-food, formed from flax seed, and of raw material for our manufactures, have increased to an extent which, a century since, would have been considered fabulous and incredible; and at a time, too, when our railways, and improved means of transit, give such increased facilities to the grower for the disposal of his produce.

**MARKETS.**—In urging upon the agriculturalists of England the propriety of an extended cultivation of flax, I am anxious, first, to show them the enormous extent of the existing markets for their produce, which is almost exclusively engrossed by the foreign producer, and the vast demand which is now opening up in consequence of the recent discovery by which flax may be employed in our silk, woollen, and cotton manufactures; and which, if not speedily secured by our home producer, must, in like manner, be supplied by the foreign grower. The markets which at present exist for flax are twofold in their character—agricultural and manufacturing. Under the former are comprised those large quantities of oil-cake, and of flax-seed for growing and crushing purposes, which are annually consumed in this country.

**OIL-CAKE.**—Upwards of 70,000 tons of oil-cake are annually imported, the value of which exceeds £500,000; the whole of which might be produced by our agriculturalists with the most perfect ease, and with profit and advantage to themselves. In connection with our supply of foreign oil-cake, it is worthy of remark, that by far the larger proportions are sent from those countries which are the largest exporters of cattle to this country. By the almost total neglect of the cultivation of flax, our farmers are thus placed in the anomalous position of dependence upon those countries for the supply of food for their cattle which compete with them in our markets, and in several instances are actually compelled, in addition to the price set upon the cake, to pay a considerable duty imposed by the Governments of the exporting countries.

**FLAX-SEED FOR CRUSHING.**—From Russia we import annually half a million of quarters of flax-seed, the value of which is upwards of a million sterling. Our total imports of flax-seed for sowing and crushing, from all countries, in round numbers, is about 650,000 quarters, the value of which, at the low price of 7s. per bushel, is £1,820,000. There is no reason whatever why this large sum might not be annually saved to the pockets of our agriculturalists, nor why the makers of linseed oil should not be supplied exclusively with home-grown seed for the purposes of their manufacture. The cultivation of flax at home, if only for the seed, would render our oil-pressers independent for their supply upon foreign countries, and would give to our agriculturalists a return of upwards of £2,000,000 annually. It would

also make an article more valuable for cattle-food than the oil-cake purchased from foreign countries, and which consists of the mere refuse and husks which remain after the expression of the oleaginous properties from the seed; or, if it should be preferred by some still to use cake, the seed could be sent to the "oil-presser," the refuse returned, and the grower might fatten his cattle upon cake produced from home-grown instead of from foreign linseed.

**SOWING SEED.**—With an increased cultivation of flax at home, we should also be spared the dependence upon foreign countries for our supply of seed for sowing purposes, and which we now import to the value of some £200,000 per annum; for it is absurd to suppose that flax can only be grown in this country from foreign seed, the reason of this opinion being traceable to the prevalent mode of pulling the flax before fully ripe.

**MANUFACTURERS.**—Passing on, however, from the agricultural demand which exists for the crop in the shape of seed, I will now call your attention to the existing market and the sources of supply for the fibre of the plant required in our manufactures. It cannot fail to be a matter of deep regret to every well-wisher of his country, that in the two main branches of our textile manufactures, we are so completely dependent for the supply of the raw material upon foreign countries. Our cotton manufactures absorb daily one thousand tons of cotton wool, the produce of foreign countries alone. For our supply of cotton, we must, no doubt, still continue to be dependent upon foreign countries, inasmuch as the material cannot be produced at home; but there is every reason to believe, that by the adaption of flax to cotton machinery, this extent of dependence will in future be considerably less than it has hitherto been, provided our agriculturists will but come forward in earnest, and endeavour to supply the new demand for their produce thus created. Our linen and other manufactures in which flax is employed are all but completely dependent upon foreign countries for their supply, and of the 100,000 tons now annually consumed, not more than one-fourth is produced in this country. The total value of the flax fibre imported for manufacturing into linen, sail cloths, tarpaulings, rick covers, sacking, and other materials, exceeds £5,000,000 annually; and there is no doubt, judging from the rapid progress of our linen manufactures, that if the supply of the raw material could be more readily obtained at home, the consumption would be increased to a still greater extent. The progress of the linen trade, in consequence of the great improvements which have been made in machinery, has within the last twenty years been almost unparalleled. The exports of linen have increased since that time from 50,000,000 to 105,000,000 of yards, and its declared value from £1,700,000 to upwards of £3,000,000. No attempt whatever has been made on the part of our agriculturists to meet this enormous and rapid increase in the demand for the raw material; and as a consequence, the foreign producer has been reaping a golden harvest from the monopoly which he has possessed. The imports of foreign flax have increased from 936,000 cwts. in 1831



to 1,800,300 cwt. in 1842. The value of the increased imports being not less than two millions and a half, nearly the whole of which is paid for by money sent out of the country.

HEMP.—We also import large quantities of hemp, which might, like flax, be easily and profitably grown at home. The value of the hemp annually imported is about £1,500,000. We have thus a demand existing for flax and hemp, and for the supply of which we are dependent upon foreign countries as shown in round numbers, by the following figures :—

|                        |            |
|------------------------|------------|
| Flax fibre.....        | £5,000,000 |
| Seed for crushing..... | 1,800,000  |
| Seed for sowing .....  | 200,000    |
| Oil cake .....         | 600,000    |
| Hemp .....             | 1,500,000  |

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£9,100,000

NEW MARKETS.—Hitherto I have spoken only of the existing markets. I am now anxious to call your attention to that great demand which will be opened up by the discovery of a mode of adapting flax to cotton and woollen machinery. The substitution of flax for cotton is now no longer a matter of doubt. Recent experiments at Rochdale and Bradford have completely set that question at rest. Important as may be the considerations connected at present with the linen manufactures, and cogent as may be the arguments deduced from them, in order to induce you to obtain possession of the ground now occupied by the foreign producer, infinitely more important, and far more forcible are those which may be drawn from the prospective demand now springing up in our cotton manufactures. The consumption of the raw material must of necessity be governed by the machinery which exists for its manufacture, and the spindles of Belfast, of Dundee, and of Leeds, are already supplied with the produce of foreign countries. Not so, however, with respect to flax and its adaptation to the cotton manufactures. Millions of cotton spindles are ready at once to take to the new material and spin it for you, without the slightest alteration being required in their arrangement. A thousand tons of cotton daily, or 770,000,000 of lbs. annually are consumed in our cotton manufactures, and the result of recent experiments has been such as to show that flax may be substituted for one-half at least of this amount. In order, therefore, to supply the new demand for a new material thus created, the produce of 2000 acres will be required for each day, and the whole of the flax grown in the United Kingdom does not amount to more than one-seventh of the supply required for Manchester alone. It is a duty imperative upon the agriculturists of the country to endeavour to meet this enormous demand, and not to allow it to pass into the hands of foreign countries, which will inevitably be the case if they do not immediately exert themselves in this respect.

FLAX WOOL.—But not Manchester alone, but the woollen districts of England await with anxiety an increased supply of flax which shall

be available for the purpose of spinning, in combination with wool, upon the existing wool machinery. I will not trouble you with statistics upon the subject of our woollen manufactures. The population of Leeds, Bradford, and other towns in the woollen districts, are kept in a state of prosperity by the employment which it affords; and the introduction of flax into that particular branch of our manufactures would have the effect of reducing the price of the material by at least 25 per cent, and of giving an increased amount of employment in those districts. One firm in Bradford has already taken steps to carry on the manufacture, and will probably require the produce of 5,000 acres in the ensuing year.

**DEFICIENT SUPPLY OF COTTON.**—In connection with the supply of the markets already referred to, a further argument is to be found in the fact of the present diminished supply of the raw material from foreign countries. "There is," says Mr. Porter in his remarks on the statistics of the cotton trade, in a paper read before the British Association last year, "a growing opinion that now, and for some years past, we have reached the maximum supply of cotton from the United States—a fact which, should it prove to be correct, makes it a matter of absolute necessity, either to seek for further supplies of the article from other sources, or to find some efficient substitute that shall provide the means of employment for our continually growing numbers." So great has been the deficiency of cotton in the United States during the past year, that the prices have risen cent. per cent. as compared with those of 1849, and our manufacturers are straining every nerve to endeavour to obtain an additional supply of cotton, and to reduce their dependence upon the United States for the supply of their staple article. The Manchester Chamber of Commerce, feeling the importance of the subject, have, at considerable expense, sent a gentleman to India for the purpose of obtaining information as to the probable extent to which they might depend upon that country for an increased supply of cotton. But to realise this much-desired benefit, there must be introduced into India a totally new system of managing the crop, and new and convenient modes of transit for bringing the produce of the interior down to the coast for shipment. Those acquainted with the habits and prejudices of the people of that country need hardly to be told with what difficulty such a change would be brought about, and how many years must elapse before the establishment of railways, or the formation of roads for the conveyance of the material produced under such an altered system. So far, then, as the arguments for an extended growth of flax in this country, founded upon the present position of our cotton manufactures are concerned, our agriculturists have to consider the diminished supply and increased price of cotton; the difficulty of obtaining the requisite supplies from other countries, and above all, the fact that flax can be advantageously employed as a substitute in those manufactures in which cotton is required.

**DEFICIENCY OF FLAX.**—If again we turn to the position of our linen manufactures, it will be found that there exists in that branch also a



most extraordinary deficiency in the supply of the raw material. In Ireland the cultivation of flax has fallen off during the past year, as compared with 1845, by nearly 60,000 acres. In Russia, from whence we derive our largest supplies, there has been a decrease in the amount of exports of flax of nearly 150,000 "poods," or about 20 per cent.; and I find in *The Morning Chronicle*, which has devoted much attention to the subject of an extension of the growth of flax, a circular of one of the largest houses in St. Petersburg, in which the following statement occurs:—

"We are to have a small supply of flax next season, not above one-half of that which we had two years ago, and such high prices are consequently paying in the interior, that the dealers will not be able to lay it down here, to cost less aboard, than it is now selling for on your side; so that we are not likely to have anything doing on contract for a long time, if at all this winter, unless the relative state of the two markets experience mutual alteration by an improvement on your side."

In Belgium, where the finest qualities of flax are produced, the cultivation of flax is considerably less than on the average of former years.

It is under these circumstances, with an increasing demand on the part of the manufacturers, and a diminished supply on the part of the foreign producer, that I venture to submit to the British agriculturist the taking some steps calculated to meet the existing state of things, to diminish our dependence upon foreign countries, and by so doing confer lasting benefits both upon himself and upon his country. There is a happy conjuncture with this state of things, and the time at which the present demand arises. Formerly, when our laws imposed restrictions, upon the importations of grain for human food, our agriculturists might have conceived that there existed some kind of moral impediments in the way of increasing our home growth of articles for any purpose not of equal primary necessity. That impediment, whether rightly or wrongly I pronounce no opinion, has, however, passed away; and there is now no reason whatever why their fields should not henceforth be used for the production of any article that promises an adequate profit to the grower.

"It is," says Mr. Porter, of the Board of Trade, "especially desirable so to apply the productive power of the soil for the supply of articles as indispensable to the support of millions of our people as corn itself; and an additional inducement to the growth of flax, beyond that offered by other articles, may be found in the fact, that, to bring it to the same condition as that in which it is imported from foreign countries, calls for the employment of a considerable amount of human labour."

**OBJECTIONS TO GROWTH OF FLAX: AGRICULTURAL.**—But, if satisfied that ample markets exist for the sale of his produce, and that this sort of moral impediment to its growth has been removed, the agriculturist may still point to the objections entertained against the growth of flax, both on account of its supposed exhaustive character, and the trouble, risk, and expense attendant upon its preparations for markets, as reasons why he should not enter upon its cultivation. With

respect to the exhaustive character of the plant, and its consequent injurious effects upon the soil, there appears to be no reason for supposing that under a proper and judicious mode of treatment, it is more exhaustive or injurious than any other seed-producing crop. An examination of the stem of the plant shows that those portions of it which are required for the purpose of manufacture, are derived almost exclusively from the atmosphere. Indeed to so small an extent do the inorganic properties of the soil enter into the fibre, that it has been found upon analysis that 100lbs. does not contain upon an average more than 2lbs. of mineral matters, including lime, magnesia, oxide of iron, carbonic, phosphoric, sulphuric acid, and silica. It is the woody parts of the plant, the resinous matter and the seed, with its capsules and husks, which absorb from the soil the phosphoric acid and other fertilizing ingredients. If the flax, unlike other crops, be not allowed to return anything to the soil; if the seed be thrown into the steep pit or "rettery" with the stem of the plant, and there destroyed; if, instead of being mixed with other food for cattle, or being used for manure, the straw or woody parts be rendered perfectly useless for such purposes, then undoubtedly flax, like every other crop, would be in itself an exhausting crop. Practical experience, however, has fully proved that under a judicious mode of treatment, so far from being an exhaustive, flax is actually a renovating crop. Numerous instances might be cited upon this subject. Mr. Edmunds, of Stonehouse, near Plymouth, stated in 1843, "It is a mistaken opinion that hemp and flax impoverish the land; from long experience I have found the contrary; these are crops that make a greater return as to manure than any corn crop."

Sir Richard O'Donnell, who is one of the largest cultivators of flax in Ireland, and who has grown to the extent of 700 acres in one year, states in *The Morning Chronicle*, "As the results of many years' experience, that when grown in its regular rotation, flax is far from being exhaustive, that it tends greatly to improve the soil and the character of the other crops in the rotation. It is above all most valuable for laying down land after wheat or oats, as the process of pulling the flax by loosening the earth around the roots improves greatly the quality of the grass crops."

Mr. Warnes, whose exertions as a practical agriculturist, to promote the extension of flax culture, are deserving of all praise, and whose system of agriculture rests upon the growth of flax, and the fattening of cattle in boxes, upon the seed, incorporated with other produce of the farm, both summer and winter, has introduced the flax plant into every rotation upon his farm; and, judging from the results of his own experience, he states that no rational objection can now be urged against the growth of flax, as the improved systems of cultivation and preparation have rendered obsolete the clauses in old leases, prohibiting the culture of the plant, and the antiquated notion that fibre and seed cannot be secured at the same time. So far, therefore, as the exhaustive character of the plant is concerned, there appears to be no sufficient ground for entertaining such opinion.



**PREPARATION FOR MARKET.**—A further objection to the growth of flax is, however, to be found in the nature of the process hitherto employed previous to its preparation for market. So long as it shall continue to be considered necessary for the grower to embark in the present troublesome and uncertain process of steeping the flax in the straw, it will be in vain to expect any very general or extensive growth of the plant. Although considerable advance has no doubt been made in the preparation of the fibre during the last few years, still the best of the present modes is far from being suitable to the great body of the farmers of the United Kingdom.

**DEW RETTING.**—Under the system of preparing the flax, hitherto four modes of steeping or retting the plant are resorted to. The first consists of the plan of "dew retting," or allowing the flax to remain exposed on grass land for a considerable number of days exposed to the action of the rain, dews, and atmosphere. The plan, however, is one which, from its obvious inconveniences, is not calculated to meet with general approval in the present advanced state of agriculture, and is indeed very rarely adopted.

**STEEPING IN STREAMS.**—Probably the best mode of steeping the flax is that of placing it in running streams, according to the mode adopted in Courtrai, the principal flax-growing district in Belgium. The flax so prepared generally realizes a much higher price than any other description. There are, however, certain peculiarities in the water of the river Lys which makes it admirably adapted for steeping purposes, and which are not possessed by any of the streams in this country. Independent of the peculiarities of the water, the steeping of flax in running streams cannot be made generally available in this country, as they are mostly too rapid in their character.

**STEEPING IN PITS.**—In the absence of suitable streams, recourse is had to a mode of steeping in pits or pools sunk in the ground. But so many favourable conditions are required to be obtained, and so many unfavourable ones to be avoided, in the selection of the site for the pool, and the supply of water required, that it is probable that a desirable or perfect steep-pool could not be formed in any part of the country. The soil forming the bottom and sides of the pit will have an influence on the colour of the fibre; clay, gravel, alluvial and peaty soil, will each impart some peculiar dye to the material, which more or less affects its value. The water used in the pit or pool must not be spring water, and it must not have flowed over any soil containing metallic deposits; and rain water is not well calculated for the purpose. But, in addition to all these difficulties attendant upon obtaining the requisite means, the grower of flax has to contend against all the uncertainties and risk of either over or under-steeping his flax. "One sultry night," says one of the reports of the Royal Flax Society, "while it is in the steep, and nearly rotted sufficiently, is enough to carry the fermentation beyond the safe point. So much is this feared by farmers, that almost all flax is underwatered; and although much of it is afterwards mannered on the grass, yet the great proportion is brought to market with the shoves still unseparated in bits on the

fibre." But while the sultry nights of summer are unfavourable to the steeping of flax, and inconvenient to the farmer, inasmuch as his labourers are at that season generally otherwise employed, it is also obvious that during the winter, when comparatively little farm labour is carried on, the process of steeping must be discontinued altogether, in consequence of the temperature.

**SCHENCK'S SYSTEM.**—A fourth process has within the last few years been very strenuously advocated by the Royal Flax Society in Ireland, which consists in steeping the flax in hot water. This mode, although doubtless an improvement upon any of the existing plans, still does not afford the means of obtaining that complete separation of the fibres which it is desirable to obtain. The Belfast Society too do not pretend that it is a mode generally applicable to the use of the producer of flax, for under what they term a "division of labour," they propose that the whole process of preparation, with the profits attendant upon it, and the additional labour required, shall be taken out of the hands of the growers, whom it designates as "a class of persons ignorant of the commonest chemical principles," and handed over to capitalists or speculators who would erect the required machinery in districts where the growth of a certain quantity of flax would be previously guaranteed. According to the reports of the Society, it appears that the profits upon the preparation of an Irish acre of flax, would be something like 200 per cent. upon the amount paid to the grower for his produce. The farmer is paid for his flax-straw a price ranging from £5 to £8 per acre; the steeper, upon this principle of "division of labour," receiving a net profit (I take the figures of the advocates of the plan) of upwards of £20.

Under such a system as this in operation, I doubt much whether the agriculturists of this country will feel very much disposed to enter upon the growth of flax to the extent which the circumstances of the case require; and in Ireland I have no doubt but that the whole scheme, fraught with so many of the abuses of the middle-man system, will soon be found alike intolerable to producer and consumer. The whole of these difficulties may, I believe, be easily overcome, by the adoption of a system more in accordance with the present advanced state of practical science and knowledge, and which involves the entire abolition of the whole of the existing modes of steeping the flax in the straw.

**PRESENT STEEPING INJURIOUS.**—Not only are the present modes of steeping inconvenient and unnecessary, but they are highly injurious, as they impart injurious dyes to the fibre, and give to it an inequality of strength, which in the subsequent stages of manufacture and bleaching, are exceedingly difficult to be overcome. I have found this to be more particularly the case in the preparation of the flax into a material capable of being spun alone or in combination with wool and cotton upon the existing machinery. I am anxious that the grower should not resort to any of the existing modes in the preparation of his flax, for any one step taken in that direction entails subsequently the



necessity of much additional trouble and expence, in addition to most materially affecting the equality of the strength of the yarns and thread produced from it.

**PURCHASE IN THE STRAW.**—The mode in which I should most prefer to purchase the flax would be in the straw, precisely as it is left after the removal of the seed. In this state it can be dealt with, with a far greater degree of certainty than in any other, and may be, within four-and-twenty hours from the time of its being pulled ripe from the field, placed in a condition fit for preparation for spinning upon any of the flax, cotton, wool, or silk machinery of the country.

**FACILITY OF TRANSIT.**—As there would be obviously many inconveniencies connected with the transit and carriage to a large distance of a material so bulky as that of flax in the straw, the grower might, in certain cases, by the use of a common breaker and a pair of toothed rollers, remove a great portion of the more bulky part of the plant, and thus send the fibre in a partially cleaned state to the market. The chaff obtained from this partial separation of the straw from the fibre, contains a very large proportion of the inorganic matter from the soil, which, not having been destroyed by the process of steeping, will form a most valuable material for mixing with cake, crushed seed, the mucilage formed from it, or other articles of cattle-food.

**FURTHER PROCESS.**—I am anxious, however, to see the growers of flax deriving the full amount of benefit which is to be obtained from the complete preparation of the material into a substance suitable at once for the markets of Belfast, Dundee, Manchester, and the woollen districts. I am aware that in the hands of individual growers the process, although not a complicated one, but which still requires some larger amount of acquaintance with the higher branches of chemistry than generally exists among the agricultural classes, might not be considered as generally available. I believe, however, that a plan might be very easily devised by which the flax grower might secure for himself these benefits which, according to the recommendation of the Royal Flax Society, are to be exclusively engrossed by speculators and capitalists. Indeed, several applications have already been made by parties, requesting me to grant them monopolies under my patent, for the preparation of flax, within an area of a certain number of miles in various parts of the country. I believe that such a course is one eminently calculated to rob the grower of his legitimate profits, and to retard that extension of the growth of flax which I conceive to be indispensably necessary for the welfare of the country. Within the last few days I have been informed of a case, in which a gentleman in Ireland, has for several years grown flax to a very great extent in one of the districts in which a monopoly is possessed by a "steeper," under the patent system. Possessed of this monopoly over a large tract of country, such an individual has the whole of the growers entirely at his mercy, and can offer them whatever sum he pleases for their produce, knowing full well that no other available market exists for many miles. Indeed, to such an extent has this system of extortion been

practised, that many of the growers have been compelled, after keeping the flax in stack for the last two or three years, to sell for 30s. per ton that for which they would have received, but for this monopoly, from £3 to £4. The gentleman to whom I have referred has now about 700 tons of flax in stack, which he will not sell at the ruinous price offered by the "steeper," and further states that he will not sow a single acre of flax in the present year, unless some fresh mode of disposing of his produce is created.

**JOINT STOCK ASSOCIATIONS.**—The mode in which I would venture to suggest this system may be prevented, and the growers be enabled to derive the full benefit of the preparation of the flax, would be, by establishments in different localities throughout the country, formed by means of joint subscriptions among the flax-growers in certain districts, at which the preparation of the material could be carried on, and the profits derived from the process distributed at stated periods among the shareholders in proportion to the amount of shares or interest which they hold in the undertaking. This system is one which has been found to work well among the cultivators of the sugar cane in the West Indies and there is no doubt but that it would work equally well among the producers of flax in this country.

**LOCAL SOCIETIES.**—A second mode by which this object could be attained would be by the erection of suitable premises and apparatus by each of the various local agricultural associations or farmers clubs in the country, the buildings and plant being the property of the club or association, and the use of them being allowed to members or subscribers, upon payment of such sums per ton or per acre as might be agreed upon by the parties.

**LANDLORDS.**—There is also a third mode which might be made available in the case of the failure of either of the preceding plans, which is, that of the erection of the required accommodation by the landlords for the use of their tenants, upon the payment of such sums as would be calculated to cover the interest of the capital invested, and the cost of keeping the buildings and apparatus in an efficient state of repair.

**PROFIT.**—There remains yet one very important point to which I have at present only incidentally alluded—I mean the profit to the farmer upon the cultivation of flax. If I have succeeded in convincing you of the extent and certainty of the markets which exist for the produce, and of the absolute necessity which exists for your endeavouring to obtain possession of those markets, I have no doubt that I shall be enabled most satisfactorily to prove that you can do so with considerable profit and advantage to yourselves.

**SEED AND FIBRE.**—It will be found, in the first place, that the profit derived from flax, under the present modes of steeping, combined with the saving of the seed, is considerably greater than can be obtained from the cultivation of wheat, at present prices. Mr. Warnes states that the profit upon fourteen acres of flax, grown and prepared by him last year, was upwards of £6 per acre over that of his wheat.



His figures are—

|                                                                                                                                                                               |       |    |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|---|
| Prepared flax sold at Leeds .....                                                                                                                                             | £238  | 16 | 0 |
| Value of seed .....                                                                                                                                                           | 126   | 0  | 0 |
|                                                                                                                                                                               | <hr/> |    |   |
|                                                                                                                                                                               | 364   | 16 | 0 |
| Deduct cost of preparing flax .....                                                                                                                                           | 140   | 0  | 0 |
|                                                                                                                                                                               | <hr/> |    |   |
| Gross profit .....                                                                                                                                                            | 224   | 16 | 0 |
| Value of produce of 14 acres of wheat at<br>38 bushels to the acre, at 40s. per quarter                                                                                       | 133   | 0  | 0 |
|                                                                                                                                                                               | <hr/> |    |   |
| Total balance in favour of flax over wheat,<br>not including 6 tons 6 cwts. of husks<br>equal to hay, 26 cwts. of tow, and many<br>loads of refuse for littering cattle ..... | £91   | 16 | 0 |

**SEED ALONE.**—The above is an instance in which both the seed and the fibre were saved and prepared. There are cases, however, in which the flax is grown solely for the purpose of seed; and others in which the seed is wasted or destroyed, the only object in such case being to obtain the fibre. In either case there is a greater profit to the grower than can be obtained from almost any other crop. Mr. Beare, probably one of the best farmers in the county of Norfolk, grows every year one or two acres of flax after wheat, and without manure, for the seed only. His crop last year yielded 26 bushels per acre, which he sold at 10s. per bushel, being £13 per acre; while his wheat crop did not exceed five quarters, which sold at 40s., would yield but £10, leaving a profit in favour of flax seed alone over wheat (the straw being used as litter for cattle) of £3 per acre. I may state upon this point, as a general rule, under the present system, that, when grown for its seed alone, the flax fibre is coarse, and is not considered of so much value as that of a finer description.

**FIBRE ALONE,—SEED DESTROYED.**—Numerous instances might be adduced from the reports of the Royal Flax Society to show that, even in cases where the seed has been thrown into the steep pits and destroyed, the profit upon the sale and preparation of the fibre was still greater than that of many other of the crops. As the example thus set is one, however, which is not likely to be generally followed by enlightened agriculturists in this country, it is unnecessary for me to trouble you with any figures upon that point.

**NEW PROCESS.**—These, however, are returns obtained under the present mode of steeping and preparing the flax. According to the plan which I venture to submit, the returns will, I anticipate, be even more favourable to the grower.

**SOLD IN STRAW.**—In the case in which he may elect to dispose of his flax in the straw, the farmer would derive the full value of his crop of seed, and the straw would be worth to him 4*l.* per ton, the produce being about two tons per statute acre. He will not be required, as

is the case at present, to pull his flax before it is perfectly ripe, or before the seed has been fully and completely formed. Indeed the coarser and more developed is the stem of the plant, the more valuable will it be for the purpose of adaptation to the woollen and cotton machinery, and the fine gossamer threads can be produced from it with greater certainty and precision than when pulled in an earlier stage of its growth. The grower, therefore, need be under no fear as to the fineness of his crop, and he may obtain from it as large an amount of seed as his land will produce.

**PARTIAL CLEANING.**—If the difficulty of transporting the flax in the straw to any great distance should render it necessary for the grower to reduce its bulk, by the removal of some of the woody part of the plant, he will obtain by so doing, in addition to the seed, a valuable article of food for his cattle, and the enhanced value of the fibre will more than repay the amount of labour bestowed upon it.

**COMPLETE PREPARATION.**—If disposed to carry the preparation of the flax to its final stage of adaptation to the spindles of the manufacturer, whether cotton, linen, wool, or silk, he will derive a profit larger and more certain than he can obtain under any of the present processes; while, from the refuse straw impregnated with the salts used in its preparation, he will obtain a manure of the richest and most fertilising character.

**SOCIAL ADVANTAGES.**—One word upon the social advantages which must result from an extended cultivation of flax, and my remarks (already I fear too protracted) will have been brought to a close. Upon this point, I cannot do better, than quote a few words from the report of one of the special correspondents of *The Morning Chronicle*, who visited the small village of Trimingham, where Mr. Warnes has for several years most sedulously and successfully devoted himself to the cultivation and preparation of the plant.

“The condition of the inhabitants of the village,” he says, “was a few years since most deplorable, and the amount of pauperism exceeded that of the adjoining parishes. Since the introduction of flax culture, this state of things has passed away. There is not a pauper in the parish; the poor-rates are nominal; there is not one able-bodied labourer, or any portion of his family, who may not obtain constant employment throughout the whole of the year, and the moral and social state of the village will bear comparison with most. If the growth of flax can produce results elsewhere similar to those which I have witnessed at Trimingham, there can be no doubt that the sooner it is cultivated to a greater extent in this country, the sooner will the enormous burden of pauperism decrease; and happiness and contentment be more generally diffused among the large masses of our labouring population.”

The communication was received with considerable applause.

#### DIRECTIONS FOR THE CULTIVATION OF FLAX.

The following plain and simple directions with respect to the



preparation of the land and cultivation of flax, are extracted from the valuable directions on the subject, compiled by the committee of the Royal Irish Flax Society from a mass of information obtained by the society, and their agriculturists during the last ten years. Some very useful instructions on the same subject are contained in a small and very valuable pamphlet called "The Flax Grower," by G. Nicholls, Esq., late secretary to the Poor Law Board, published by Knight of Fleet-street; in the various publications of Mr. Warnes, by Ridgway; and in "Flax: its Cultivation and Management," by E. F. Deman, late technical instructor to the Royal Flax Society; and "Flax: its Manufacture on Schenck's System," by A. Bernard and Koch; also published by Ridgway.

**SOIL AND ROTATION.**—By attention and careful cultivation, good flax may be grown on various soils; but some are much better adapted for it than others. The best is a sound, dry, deep loam, with a clay subsoil. It is very desirable that the land should be properly drained and subsoiled; as, when it is saturated with either underground or surface water, good flax cannot be expected. In Belgium, it invariably follows a corn crop—generally oats; and in this country (Ireland) where oats is such a usual crop, the same system might be profitably pursued; but it must be understood, that it is only from oats following a green crop or old lea, and never after two or three succeeding crops of oats, which bad practice still prevails in some districts. Except on very poor soils, a better crop will be produced after grain, and the double benefit of the grain and flax secured. If old lea be broken up, and potatoes planted, followed by a grain crop, a very fine crop of flax may be obtained in the ensuing year.

**PREPARATION OF THE SOIL.**—One of the points of the greatest importance, in the culture of flax, is by thorough-draining, and by careful and repeated cleansing of the land from weeds, to place it in the finest, deepest, and cleanest state. This will make room for the roots to penetrate, which they will often do to a depth equal to one half the length of the stem above ground. After wheat, one ploughing may be sufficient on light, friable loam, but two are better; and, on stiff soils, three are advisable—one immediately after harvest, across the ridges, and two in Spring, so as to be ready for sowing in the first or second week of April. The Spring ploughing should be given some time before sowing, to allow any seeds of weeds in the land to vegetate, and the harrowing in of the flax-seed will kill them, and save a great deal of after weeding. Following the last harrowing, it is necessary to roll, to give an even surface and consolidate the land, breaking this up again with a short-toothed or seed harrow, before sowing, which should be up and down, not across the ridges or anglewise.

**SOWING.**—The seed best adapted for the generality of soils is Riga, although Dutch has been used in many districts of country, for a series

of years, with perfect success. In buying seed, select it plump, shining, and heavy, and of the best brands, from a respectable merchant. Sift it clear of all the seeds of weeds, which will save a great deal of after trouble, when the crop is growing. This may be done by fanners, and through a wire sieve, twelve bars to the inch. Home-saved seed has produced such excellent crops, of late, that it is strongly recommended that every farmer should only sow, each year, as much foreign seed as would produce a sufficient quantity for his flax crop of the following season. The thinner portion of the crop would be the best for this purpose, as, when flax grows thin, it produces much seed. This plan, besides the saving effected in the price of foreign sowing seed, would effectually secure the farmer from any danger of loss from fraudulently-made-up seed. The proportion of seed may be stated at three and a-half imperial bushels to the Irish or Plantation acre; and so on in proportion to the Scotch or Cunningham, and the English or Statute acre. It is better to sow too thick than too thin; as, with thick sowing, the stem grows tall and straight, with only one or two seed capsules at the top; and the fibre is found greatly superior, in fineness and length, to that produced from thin-sown flax, which grows coarse and branches out, producing much seed, but a very inferior quality of fibre. After sowing, cover with a seed harrow, going twice over it—once up and down, and once across or anglewise; as this makes it more equally spread and avoids the small drills made by the teeth of the harrow. Finish with the roller, which will leave the seed covered about an inch—the proper depth. A stolen crop of rape or Winter vetches, or of turnips of the stone or Norfolk globe varieties, may be taken, after the flax is pulled. Rolling the ground after sowing is very advisable, care being taken not to roll when the ground is so wet that the earth adheres to the roller.

**WEEDING.**—If care has been paid to cleaning the seed and soil, few weeds will appear; but if there be any, they must be carefully pulled. It is done in Belgium by women and children, who, with coarse cloths round their knees, creep along on all-fours. This injures the young plant less than walking over it (which, if done, should be by persons whose shoes are not filled with nails.) They should work, also, facing the wind, so that the plants laid flat by the pressure may be blown up again, or thus be assisted to regain their upright position. The tender plant, pressed one way, soon recovers; but, if twisted or flattened by careless weeders, it seldom rises again.

**PULLING.**—The time when flax should be pulled (if intended to be treated for flax cotton) is, when perfectly ripe; if it is desired to obtain a fine fibre suitable for the present flax manufactures, the best time for pulling is, when the seeds are beginning to change from a green to a pale brown colour, and the stalk to become yellow, for about two-thirds of its height from the ground. When any of the crop is lying, and suffering from wet, it should be pulled as soon as possible, and kept by itself. If the ground has been thorough-drained, and laid out evenly, the flax will be all of the same length. It is most essential to



take time and care to keep the flax even, like a brush, at the root ends. This increases the value to the spinner, and, of course, to the grower, who will be amply repaid, by an additional price, for his extra trouble.

The following directions with respect to the removal of the seed from the flax, are given in the *Flax Grower*, by G. Nicholls, Esq.—

“The separation of the seed is usually effected by beetles or blocks of wood about nine inches long and four inches square, into which a handle of convenient length, and somewhat bent, is fixed, and with which the seed is readily beaten out. It may also be removed by simply drawing the flax stalks through a row of iron spikes set upright in a wooden frame, and so close to each other as to catch and separate the bolls containing the seeds, as the stalks are drawn through.”

The flax may be stacked when pulled perfectly ripe and dried, either before or after the removal of the seed, as may best suit the convenience of the grower.

Further information with respect to the terms upon which the inventor is prepared to grant licenses, as well as the mode to be adopted in the preparation of the flax, may be obtained upon application to Mr. J. S. Christopher, 26, Gresham Street, where the machine for partially separating the straw from the fibre may be seen.

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A suggestion has been made by a correspondent, that the price of linseed mentioned by Mr. Druce at page 23, may be a trifle too high. As seed, it may be worth, and at this moment is worth more than 8s.; 10s. and 12s. being paid. But for crushing for oil or for cake, it has been suggested as a calculation for the future, that 6s. 6d. or 7s. is nearer the mark. We think for seed, that English will always have a preference, and be worth the price named, and even for crushing, we think that 8s., at least 7s., will be the average when well cleaned.

## APPENDIX A.

PROSPECTUS OF CLAUSSEN'S PATENT FLAX COMPANY (PROVISIONALLY REGISTERED).—The National importance of the Chevalier Claussen's processes for the preparation of Flax is now so universally admitted, that it is needless to dilate upon them. A few statistics, however, in a compressed form, may be satisfactory to Capitalists about to join this Company, formed for the extension of the growth and manufacture of this important British Staple.

Desirable as general intercourse with Foreign Nations is, still a dependance upon any country for any one staple article is much to be deprecated. Unfortunately, as regards the article of flax, we are almost entirely dependant for our supply upon foreign countries. Even our supply of oil-cake, the produce of the flax plant, so important to our graziers, to the extent of 70,000 tons per annum, is obtained from foreign countries, its annual value exceeding £500,000.

The quantity of linseed imported for crushing into linseed oil amounts to 650,000 quarters, the value of which, at 7s. per bushel, is £1,820,000.

The quantity of linseed imported for sowing purposes is valued at £200,000. These three items alone amount in value to a sum of £2,520,000.

One of the objects sought to be obtained by this Company is, to produce upon our own soil, with profit and advantage to the farmer, the flax required to meet these enormous demands.

This, however, is but one collateral advantage which the Company proposes as its object. The full importance of our flax manufactures may be estimated from, the fact that our manufacturing consumption of flax amounts to about 100,000 tons—not more than one-third of which is produced at home. This quantity being worked up into linen, etc., exceeds in value £5,000,000 annually; and were a greater quantity produced in this country, the consumption of the manufactured article would increase in a corresponding proportion. As showing the character of the linen trade, it may be stated, that the exports of linen alone, in the last twenty years, have increased from 50 millions to 105 millions of yards, its declared value from £1,700,000 to £3,000,000. The import of foreign flax in 1831, was 936,000 cwt.; in 1842, it had increased to 1,800,300 cwt., since which time it



has continued to increase. The value of the increased imports, about two and a half millions sterling, is paid for principally in money sent out of the country, instead of benefiting our own farmers. The total value of the before-mentioned items is £9,100,000.

In proposing, therefore, to apply capital to the extension of the growth and manufacture of flax, it is not proposed by the promoters to force a cultivation or a trade, that is unsuitable to this country; but rather to give increased facilities to our great existing agricultural and manufacturing interests. To whatever extent the growth of flax in this country may reach, experience and analogy would lead us to expect, that a commensurate demand will arise for the produce. Population increases both here and abroad, and demands new exertions to keep pace with the public requirements. The want of raw material alone limits the amount of our manufactures, and retards the erection and operation of new looms, and the employment of additional labour. The signal prosperity of the North of Ireland, more particular Belfast, may be cited with the utmost confidence as proving the advantages to be derived from the growth and manufacture of flax.

Irrespective, however, of the great demand existing for flax, and its ordinary application to linen fabrics, the Chevalier Claussen, by a happy invention, is enabled to convert the flax fibre into a substance so completely similar to cotton, that a new and most extensive demand for the fibre has already arisen to encourage the cultivation of flax. The fabrics that have been made partly of American cotton, and partly or entirely of Claussen's flax or British cotton, take in a range of goods which will probably require 200,000 tons per annum of this new material to supply Lancashire and Yorkshire alone.

To produce this quantity, it will call into profitable cultivation at least 1,000,000 acres beyond the present breadth of land under flax.

By these processes of Chevalier Claussen, the *Cotton* manufacturer obtains a fibre capable of being spun and woven on the ordinary cotton machinery either alone or mixed with cotton in any proportions; the yarns made of which, are stronger than cotton, while the fibre is produced at less price than cotton, or any other filament, can be imported at a profit.

The *Flax* spinner, by this process, has the fibre prepared cleaner, cheaper, and more expeditiously than by any existing process. more easy to spin, and capable of being bleached in one-tenth of the time occupied in the customary process, and, consequently, without the usual loss and waste.

The *Woollen* manufacturer may also be benefited by the use of flax prepared by the processes of Chevalier Claussen, inasmuch as he may obtain a fibre capable of being spun with wool in any proportion on ordinary woollen machinery; the cloth made from such mixed yarns filling up in the milling stocks exactly as if all wool, and it is stronger and more durable than a cloth entirely wool, while the prepared fibre, capable of this combination, may be produced at less than one-fourth of the price of ordinary low wools.

The interest which the *Agriculturists* possess in these processes has already been alluded to; but it will bear some further remarks. The demand for the raw material produced by the farmer, if rendered marketable, may well be called "boundless." By Claussen's first mechanical process, the plant is deprived of its excessive bulk and weight, and is thus rendered easy of transport by the farmer, thereby removing the chief existing impediment to its growth. The bulky nature of the straw also prevents importation of foreign straw, thus operating in favour of the home grower.

All these great changes, which time would gradually effect, require for early development the aid of a powerful Company; private means, however extensive, and private enterprise, however energetic, are inadequate for the immensity of the field proposed to be occupied by Claussen's Patent Flax Company. To prepare the quantity already required, is far beyond the means of a private undertaking—establishments are wanted in various flax districts to purchase the flax straw of the farmer near his own homestead, there to reduce its bulk and to convert it into British cotton, and to send it to Manchester and other markets. To erect these establishments and to afford these facilities to farmers, needs the capital of a truly National Company. The intention is to aid the farmer as well as the cotton, the woollen, and the linen manufacturer.

No staple has such general adaptation, none is so truly national, as the flax plant.

The recommendations obviously belonging to this Company will be enhanced, when it is considered that British cotton is the produce of free instead of slave labour, and that the abolition of slavery will be accelerated by the success of the Company. It may also be stated, that the farmer and the farmer's family will have the means of making a market for their own produce, to an unlimited extent.

The employment of the poor will be also greatly promoted by the extended growth and preparation of flax.

An increased growth this year, in consequence of the introduction of the Chevalier Claussen's process, proves that the farmers are ready to grow; the manufacturers at the same time are ready to buy all the British cotton produced; the only link wanting, therefore, in the chain, is the formation of the Company, for the purchase of the flax and the preparation of the fibre.

Profit is the basis of all Companies, and subjoined are presented some details, to show the advantages in this point of view, which may be expected from the formation of Claussen's Patent Flax Company.

The farmers, as well as the manufacturers, naturally will become interested in the Company, and thus participate in the profits to be derived from the after-preparation of the material grown by themselves. A cheap fibre, produced by the successful operations of this Company, cannot fail to create a common interest between farmer and manufacturer, and give increased employment to the labouring population.



## CALCULATIONS AND ESTIMATES.

On the average, *four* tons of flax straw will produce one ton of British cotton.

The cost of *five* tons of flax straw, say at £3 per ton, is - £15 0 0

The expenses of "breaking," "cutting," and "blowing,"

will not exceed - - - - - 1 19 0

Chemical preparations and ingredients employed - - - 1 5 0

Thus one ton of fibre, called British cotton, equal to fair

quality American cotton, will cost, at the utmost - - £18 4 0

Add to this (where required) the bleaching - - - 1 0 0

Washing, drying, etc. etc. - - - - - 1 16 0

Total cost of the British cotton bleached and washed, per ton £21 0 0

Or 2½*d.* per lb., and which will readily sell at from 4*d.* to 6*d.* per lb.

For *Wool*, the expenses of preparation are about the same; but it requires blowing and carding well afterwards, which processes are extra, say 1*d.* per lb., but it will then sell to the wollen manufacturers at from 6*d.* to 10*d.* per lb.

Thus the profits are just 100 per cent.; but allowing for interest on capital invested, the purchase of the exclusive licence from the Patentee, according to agreement, the cost of buildings, machinery, and the management of the Company, the profits may be stated always to exceed 50 per cent. per annum.

Each plant, erected at the cost of £2000, would prepare 10 to 15 tons per week, say 500 tons a year, and a profit of £5 per ton only would amount to £2500 a year.

But 200,000 tons of British cotton are wanted, so that a great many establishments on a large scale are required to supply the wants of the country.

Specimens, shewing the whole of the Chevalier Claussen's process, from the flax-straw to the finished cotton, linen, or wollen fabrics, in unbleached, bleached, and dyed states, are shewn in the South Gallery of the Great Exhibition. The hand-book to the official catalogues of the Great Exhibition, edited by Robert Hunt, Esq., thus describes the advantages of the process as exhibited in the Chevalier Claussen:—

"In the first stage it will enable the farmer, by mechanical means, and with little trouble and expense, to reduce the bulk of his flax crop, so as to give him access to markets and render it marketable. It will enable him at the same time to preserve, to be returned to the land, those portions of the crop which tend to exhaust the soil; the produce being a description of fibre adapted to the coarser kinds of the flax manufacture. By the second, or boiling operation, the long troublesome, and noxious process of steeping may be dispensed with, in the preparation of flax for the finer purposes, for which long fibre is spun in the ordinary way. Lastly, by reducing the flax to short fibre, and by splitting it up by means of the chemical process above described, a

great extension of the demand for flax may be expected, to be spun on cotton, wool, and silk machinery alone, or in combination with any of those substances. All these results will have been obtained through microscopic researches into the structure of the flax plant, and the application of chemical knowledge to the improvement of old processes for preparing it for use."

#### APPENDIX B.—REMARKS OF THE MORNING CHRONICLE.

THE GREAT EXHIBITION.—Continuing our daily descriptions of the articles at the Exhibition, we propose now to call the attention of our readers to one of the most important and interesting inventions there displayed—that of the Chevalier Clausen's Flax Cotton.

##### FLAX—No. 3.

The subject of Flax Cotton, paradoxical as its name may appear, is one not altogether new to the readers of the *Morning Chronicle*. Some time since we announced the discovery of a process by which the harsh and elastic fibres of the flax plant might be converted into a soft, down-like substance, analogous to the fibres of cotton, and capable of being treated, in its after stages, in every respect similar to it. But we stated that, unlike cotton in one respect, it possessed felting properties, which adapted it equally for spinning in combination with wool, and that fabrics produced from a mixture of flax and cotton, or flax and wool, possessed a degree of softness and strength which did not characterise those formed entirely of the one staple. We stated also that, in consequence of the alterations effected in the character of the fibre, the flax would be capable of taking dye, and receiving impressions similar to any other fibre, whether animal or vegetable; and further, that the substance so produced could be prepared and sold with profit to the producer, at a price less than that at which cotton could be profitably imported into this country.

The announcement of such a discovery was received by many persons with incredulity. Some supposed that we had been grievously imposed upon; but others, judging more correctly, inferred that we should not have committed ourselves day after day to statements of facts, the accuracy of which we had not the fullest opportunity of testing and verifying. For this reason we declined to notice attacks made upon us by parties who ought to have been the first to hail such an invention, which, if successful, would do so much to promote and encourage the growth of flax in the United Kingdom. We thought it sufficient to leave the Great Exhibition to give a satisfactory answer to all objections, and to afford a practical demonstration of the accuracy of our statements. The event has more than justified our anticipations; and in the numerous specimens exhibited by Chevalier Claussen in the south gallery of the Exhibition, as well as in the departments of Canada, Russia, France, and Austria, will be found the most complete confirmation of every statement which we have made upon the subject.



With respect to the great value of the invention, when carried out, to the country—whether regarded in an agricultural or manufacturing point of view—whether as affording to our agriculturists a market for a profitable and beneficial crop, as rendering them independent of foreign aid for their supply of oil-cake produced from the flax-seed, or as bringing to the assistance of the cotton and woollen manufactures a valuable auxiliary, available at all times and all seasons—there cannot, we apprehend, exist a difference of opinion in any reasonable mind.

The history which Chevalier Claussen gives of the causes which first led him to experiment upon flax, for the purpose of "cottonizing" it, is exceedingly interesting, inasmuch as it shows that his success was the result of inductive research, and not the offspring of mere chance. He tells us that, in wandering along the luxuriant banks of one of the Brazilian rivers, his attention was attracted to a white, down-like substance, adhering to the branches of trees, overhanging and touching the stream. On obtaining a quantity of it, he was so pleased with its character that, thinking he had discovered some hitherto unknown vegetable product, he was determined to trace it, if possible, to its source, and to ascertain the plant which had yielded it. With the ardour of a naturalist he commenced his task, and eventually found that the substance had been washed from a bed of flax-straw, the produce of some of his own land, and which, long before, he had caused to be thrown, as useless, near the banks of the river. To this heap the swollen waters had occasional access—fermentation and the decomposition of a portion of the plant had taken place—and in time the influence of natural chemistry had so separated the filaments of the flax fibre as to give the mass a cotton-like appearance; and some of it, having been washed into the river, had been arrested by the overhanging branches. Although the substance thus accidentally discovered was far from being in that condition which would fit it for the hands of the cotton-spinner, yet, even in its then imperfect state, it led the Chevalier to entertain the idea of the possibility of completing, by the aid of artificial chemistry, that which nature had but partially accomplished.

The first object worthy of notice in the stand of Chevalier Claussen, is a machine for the purpose of reducing the bulk of the flax crop by the removal of a considerable portion of the straw from the stem of the plant, leaving the fibre in a partially cleaned state. Hitherto the great difficulty with all growers of flax has been the preparation of the crop for market; the grower having been compelled either to resort to the tedious and precarious process of steeping his flax, or to dispose of it to factors as it came from the field, upon any terms which they might think proper to offer, as the great bulk of the crop prevented the farmer from sending it to market in the same manner as he would send his grain or other produce. In order to extricate the farmer from this dilemma, and to afford him the means of availing himself of the best market for his produce, this machine has been constructed, which will enable him, without resort to any steeping process, to reduce the bulk

of his flax, and at the same time admit of his returning to the soil, in the shape of the straw removed, a large portion of the nutritive matter extracted—and which, formerly destroyed in the steeping process, had given rise to an opinion very generally held by agriculturists, that flax was an extremely exhaustive crop. Several specimens of the flax thus cleaned by the machine are shown.

The flax thus produced is in this stage adapted for the manufacture of sail cloth and other coarse fabrics, ropes, cordage, etc. It requires, however, a more minute separation of the fibres to adapt it for the manufacture of finer descriptions of fabrics. To make the subject perfectly familiar to the reader, it will be necessary to explain the structure of the flax fibre. The stem of the flax plant consists of three distinct parts—the shive, straw, or woody matter which supports the plant; the fibres, which cover the outer surface of the straw; and the gum or resin, by which the fibres are held together. The machine, as we have already described, removes the straw only, and partially disintegrates the fibres held together by the resinous substance. Hence their coarseness and their suitability for coarse fabrics only. In order to adapt it for the linen manufacture, as also to carry it one stage further in the process of preparation for the cotton or wool spinner, it is necessary to obtain a more complete separation of the fibres. This object is to be accomplished by the removal of the resinous and glutinous substance which binds them together; and as it does not appear that mechanical power will completely effect this, recourse is had to chemical action.

A second series of samples shown by the Chevalier Claussen consists, therefore, of long flax prepared for the linen manufacturer by a process which appears completely to obviate most of the inconveniences attending the ordinary modes of steeping. By this process the flax is boiled (either in the straw as it comes from the field, or in the state in which it leaves the growers' hands, with its bulk partially reduced by mechanical means), for two or three hours in a weak solution of caustic soda. The action of the soda dissolves completely the resinous and other substance of the plant, while, by its combination with the oleaginous matters that it contains, it produces a soapy kind of liquid, which removes at the same time all the colouring matter from the plant—leaving it, unlike flax steeped upon the ordinary mode, perfectly free from all stain and impurity, and thereby facilitating greatly the after processes of bleaching or dyeing, whether in the yarn or in the finished cloth.

Passing from the specimens illustrative of the processes of preparing the flax for the linen manufacture, we next come to the interesting series of samples, showing the mode by which the flax is prepared for the cotton spinner. The first step necessary in this process, is the reduction of the flax fibre to lengths adapted for spinning on cotton machinery. These required lengths are obtained by a very nicely adjusted piece of mechanism, similar in its principle to the ordinary chaff-cutting machines. It is here that the greatest accuracy is required, as, if any of the fibres exceed the required length, the yarns



produced will "bite" in the rollers, and present the appearance of being "overworked," and will also be unequal in strength. The flax may be cut for this purpose either in the straw as it comes from the field, with its bulk partially reduced, or after it has undergone the boiling process. But in order to spin flax successfully upon cotton machinery, something more is required than the mere reduction of the length of the fibre. After having undergone the boiling or steeping process, and when the glutinous matter which binds them together is removed, the fibres, however fine, are still harsh, coarse, and elastic, when compared with cotton; and the quantity in length of yarn obtained from equal weights of flax and cotton would be so greatly in favour of the latter, as completely to preclude the possibility of the former being substituted for it. For instance, one pound of fair bowed Georgia cotton, spun into 30's, will yield 25,200 yard; while one pound of flax spun into "line" of a number about equal to that of the cotton yarn, would produce but 21,000 yards; giving an advantage of 4,000 yards in the pound to cotton over flax. In addition to this, the yarn would be produced from the raw cotton, by cotton machinery, at an expense of less than threepence, while that of the flax would be about tenpence the pound when prepared by the flax machinery. This is a difficulty which has hitherto lain at the root of every attempt to spin flax successfully and profitably upon cotton machinery. A minute's attention, however, to the structure of the flax fibre suggested to the Chevalier Comusen a mode by which it might be successfully overcome. The fibre of flax is cellular, and is formed of the union of bundles of smaller fibres which may be compared to the Roman fascies. If by any process the character of the fibre could be altered—if the minute hair-like cellular substance could be further divided—it is obvious that the required increase in length and diminution of bulk could be obtained. But how was this feat to be accomplished? Hair-splitting, even upon a small scale, has always been considered as partaking somewhat of the impracticable; and to accomplish this process upon a large scale—to split this fine hair-like substance by hundred-weights at a time, and to do it at a trifling cost—would appear to be beyond the bounds of possibility. The feat has, however, been accomplished by the Chevalier Claussen—and what is more, the result is effected instantaneously.

One great advantage in connection with this mode of preparing the flax—and it is one of the highest importance to the agriculturist—is, that the flax will not be required to be pulled before it is fully and completely ripe, as is now the case where a fine flax is required. A valuable crop of fully ripened seed may therefore be obtained, in addition to the fibre. Moreover, we are told that the flax cotton may be prepared at a cost considerably less than that at which cotton can be profitably grown and imported. Of course it is not to be supposed that, in order to prepare flax cotton, any person would act so absurdly as to purchase flax steeped and scutched in the mode in which it is usually brought into the market for the flax-spinner. The great point in the invention is, that the flax may be taken from the field, and con-

verted into a soft, cotton-like substance, at a cost considerably less than that incurred even in the ordinary modes of steeping and scutching, in order to prepare it for the flax-spinner. Prepared for the market by steeping and scutching, flax will range in price from £40 to £120 per ton; and to operate upon a fibre so prepared, in order to produce a material which would sell for half that amount, would be, indeed, something like an attempt to transmute gold into copper. This, however, is not the object of the invention. The Chevalier Claussen commences, as is shown by the samples in his stand, at the same point where the ordinary flax-dresser commences—at that of the flax in the straw; and by producing a larger quantity at a greatly reduced cost, and without incurring any waste in the shape of refuse tow, he obtains an article capable of being spun on the ordinary cotton machinery, and of being sold at a price which, while it is less than that of the long flax prepared for the linen manufacturer, is also lower than that at which cotton itself can be profitably grown, either by free or slave labour, in the great cotton-producing district of the United States.

The flax cotton is shown dyed in various colours immediately after carding; it is also shown dyed in various colours in yarns spun entirely from flax, or mixed with various proportions of cotton; and in the case of the mixed yarns no difference of colour of the two substances is at all perceptible—thus showing that the flax so prepared is capable of taking the same opaque dye as ordinary cotton. Some samples of flax prepared as silk are also displayed, and, as illustrating the great command which the inventor has over this fibre: these are dyed in colours possessing all the glossiness and brilliancy of the most beautiful silk. Several pieces of calico, formed entirely of flax, and others, formed of a mixture of flax and cotton, bleached and dressed as ordinary cloth, are exhibited.

Continuing his inspection, the visitor will next see specimens of yarns formed of a mixture of wool and flax-cotton. Hitherto it has been found impossible to felt or mill yarns, or fabrics formed of a mixture of flax and wool, or even to produce a yarn formed of these two substances, as the flax naturally does not possess the same felting properties as wool. As we stated, however, at the commencement, the flax, and even cotton itself, undergoes a considerable change in its structure when prepared by the Chevalier Claussen, and the former is found to felt equally as well as wool. Indeed, some specimens of felt formed of rabbit's hair and flax are shown, as illustrative of the great felting properties which the "cottonized" flax fibre possesses. In addition to the mixed wool and flax-cotton yarns shown, there are displayed several pieces of excellent flannel formed of those yarns, and pieces of broad cloth, grey and dyed, of a remarkably clean, bright, and pure colour, and of great strength and durability. The great advantages which this discovery places in the way of the woollen manufacturer are too obvious to require comment. A substance equal in every respect to wool, and admirably adapted for mixing with it, is given to the manufacturer at a price something less than one-fourth of



that of his ordinary staple—thus enabling him to produce a mixed woollen fabric at a proportionally lower rate than he is able to manufacture his woollen goods; while, at the same time, the purchaser will be benefited, by obtaining at a greatly reduced price an article equally durable with one formed entirely of the more expensive fabric.

The last series of specimens shown are those which illustrate the applicability of the flax-cotton to the purposes of the Leicester and Nottingham hosiery trade. The articles shown consist of stockings, drawers, and other ordinary articles of hosiery, and both in colour and in texture they are everything which can be desired. To those interested in the continued and increased prosperity of our great agricultural and manufacturing industries, we would recommend an attentive examination of the articles shown by the Chevalier Claussen. The advantages attendant upon flax culture are points from which we have abstained in our present remarks; but we would cordially commend to the notice of agriculturists the desirableness of immediately putting themselves in a position to supply the extensive demand which will no doubt shortly arise for flax, and to obtain possession of a market for the supply of which our energetic transatlantic cousins appear to be already making great preparations.

Some specimens of flax cotton dyed and prepared as Berlin wool are shown by Messrs. Quitzow and Schlesinger, of Bradford, in the woollen compartment in the English side.—*Morning Chronicle*, August 1, 1851.

#### APPENDIX C.—EXTRACT FROM NEW YORK TRIBUNE.

##### FLAX-COTTON.

Mr. Horace Greeley, of New York, has devoted the twelfth of his series of articles in the *New York Tribune*, called "Glances at Europe," to the "flax-cotton revolution." Mr. Greeley is at present staying in London; and having been selected as one of the jurors of the United States, he has, in that capacity, devoted considerable time and attention to the examination of the articles in the Great Exhibition. He states:—

"M. Claussen is here, and has kindly explained to me his processes, and shown me their products. He is no inventor of flax-dressing machinery at all, and claims nothing in that line. In dressing, he adopts and uses the best machines he can find, and I think is destined to receive important aid from American inventions. What he claims is mainly the discovery of a cheap chemical solvent of the flax fibre, whereby its coarseness and harshness are removed, and the fineness and softness of cotton induced in their stead. This he has accomplished. Some of his flax-cotton is scarcely distinguishable from the Sea Island staple, while to other samples he has given the character of wool very nearly. I can imagine no reason why this cotton should not be spun and woven as easily as any other. The staple may be rendered of any desired length, though the usual average is about two inches. It is as white as any cotton—being made so by an easy and cheap bleaching

process. M. Claussen's process, in lieu of the old process of rotting, requires but three hours for its completion. It takes the flax as it came from the field, only somewhat dryer and riper than usual, and with the seed beaten off, and renders it thoroughly fit for breaking. Specimens, dyed red, blue, yellow, etc., are exhibited, to show how readily and satisfactorily the flax-cotton takes any colour that may be desired. Beside these lie rolls of flannels, feltings, and almost every variety of plain textures, fabricated wholly or in good part from flax as prepared for spinning under M. Claussen's patent, proving the adaptation of this fibre to almost every use now subserved by either cotton or wool. The mixtures of cotton and flax, flax-cotton and wool, are excellent and serviceable fabrics.

"The main question still remains to be considered—will it *pay*? Flax may be grown almost everywhere—two or three crops a year of it in some climates—three times the present annual product of cotton, flax, and wool, all combined, could easily be produced even next year. M. Claussen says, the flax-straw, or the ripe, dry plant as it comes from the field, with the seed taken off, may be grown even here for \$10 per ton; but he will concede its cost for the present to be \$15 per ton delivered, as it is necessary that liberal inducements should be given for its extensive cultivation. Six tons of the straw or flax in the bundle will yield one ton of dressed and clean fibre—the cost of dressing which by his methods, so as to make it flax-cotton, is \$35 per ton. (Our superior Western machinery ought considerably to reduce this). The total cost of the flax-cotton, therefore, will be \$125 per ton, or six cents per pound, while flax, as it comes from the field, is worth \$15 per ton; should this come down to \$10 per ton, the cost of the fibre will be reduced to \$95 per ton, or less than five cents per pound. At that rate, good 'field-hands' must be rather slow of sale for cotton-planting at \$1,000 each, or even \$700.

"Is there any doubt that flax-straw may be profitably grown in the United States for \$15 or even \$10 per ton? Now the seed is morally certain to command, for two or three years at least, a higher price than hitherto, because of the increased growth and extended use of the fibre. Let no farmer who has flax growing be tempted to sell the seed by contract or otherwise, for the present; let none be given over to the tender mercies of oil-mills. We shall need all that is grown this year for sowing next spring, and it is morally certain to bear a high price even this fall. The sagacious should caution their less watchful neighbours on this point. I shall be disappointed if a bushel of flax-seed be not worth two bushels of wheat in most parts of our country next May.

"Our ensuing agricultural fairs, state and local, should be improved for the diffusion of knowledge and the attainment of concert and mutual understanding with regard to the flax culture."

Mr. Greeley goes on to state that the flax, roughly prepared by the partial separation of the straw by an inexpensive machine, and without steeping, "may be transported even a hundred miles to market at a



moderate cost, and there can be no reasonable doubt of its commanding a good price. M. Claussen assures me that he could now buy and profitably use almost any quantity of such flax, if it were to be had. The only reason, he says, why there are not now any number of spindles and looms running on flax-cotton, is the want of the raw materials. His patent is hardly yet three months old.

“Of course there will be disappointments, mistakes, unforeseen difficulties, and disasters, in flax growing; but I believe the fullest inquiry, the most careful calculations, preliminary to any decisive action, will lead to very extensive flax-sowing next year—to the erection of flax-breaking machinery at a thousand points where none such have ever yet existed—and ultimately to the firm establishment of new and most important branches of industry. Our own country is better situated than any other to take the lead in the flax business; her abundance of cheap fertile soil, and of cheap seed, the intelligence of her producers, the general diffusion of water or steam power, and our present superiority in flax-breaking machinery, all point to this result. It will be unfortunate alike for our credit and our prosperity if we indolently or heedlessly suffer other nations to take the lead in it.”

# Great Exhibition of the Works of Industry of all Nations, 1851.

SOUTH WALL, GROUND FLOOR, NEAR NO. 9 DOOR,  
WEST OF THE TRANSEPT.

[Extract from the OFFICIAL DESCRIPTIVE and ILLUSTRATED CATALOGUE.]

## UNITED KINGDOM.

CLASS 4, No. 135.—Vegetable and Animal Substances used in Manufactures.

FAUNTLEROY, ROBT., & SONS, Pottery Fields,  
Tooley Street, London.

Classification of specimens of foreign hard-woods, for cabinet work, turnery, dyeing, and machinery; also, of elephants' tusks, sea-horse teeth, mother-of-pearl shells, &c.

| Names.                                                                                                                       | Places of Produce.                                                                    | Purposes.                                                   |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 1. Amboyna, or Kiabooka ( <i>Pterocarpus indicum</i> ).                                                                      | E. Indies, Borneo, Amboyna.                                                           | Cabinet-work.                                               |
| 2. African black wood (Coccoloba pterota).                                                                                   | Africa, Madagascar, &c.                                                               | Turning.                                                    |
| 3. Angica . . . . .                                                                                                          | The Brazils . . . . .                                                                 | Cabinet-work and turning.                                   |
| 4. Barwood ( <i>Baphia nitida</i> ).                                                                                         | Africa, (W. Coast) Guinea (Demerara).                                                 | Dyeing and turning.                                         |
| 5. Beetwood, or Bully tree ( <i>Rubinia pauciflora</i> ).                                                                    | N. S. Wales . . . . .                                                                 | Machinery and turning.                                      |
| 6. Bitany Bay Oak ( <i>Casuarina striata</i> ).                                                                              | Turkey . . . . .                                                                      | Turning and brush-making.                                   |
| 7. Boxwood ( <i>Buxus balcanica</i> ).                                                                                       | England, Spain, &c. . . . .                                                           | Turning, machinery, and wood engraving, &c., &c.            |
| Boxwood ( <i>Buxus sempervirens</i> ).                                                                                       | England, Spain, &c. . . . .                                                           | Turning.                                                    |
| 8. Brazil wood ( <i>Cassipouia brasiliensis</i> ).                                                                           | The Brazils . . . . .                                                                 | Dyeing and turning.                                         |
| 9. Brazilwood ( <i>Cassipouia</i> ).                                                                                         | Jamaica and the Bahamas . . . . .                                                     | Cabinet-work.                                               |
| 10. Cam wood ( <i>Baphia nitida</i> ).                                                                                       | Africa, West Coast . . . . .                                                          | Cabinet-work and turning.                                   |
| 11. Camphor wood ( <i>Camphora officinalis</i> ).                                                                            | The Brazils, &c. . . . .                                                              | Cabinet-work and turning.                                   |
| 12. Canary wood ( <i>Laurus indicus</i> ).                                                                                   | The United States . . . . .                                                           | Cabinet-work.                                               |
| 13. Cedar (pencil) ( <i>Juniperus virginiana</i> ).                                                                          | West Indies, Havana . . . . .                                                         | Cabinet-work.                                               |
| 14. Cedar (Cuba) ( <i>Cedrela odorata</i> ).                                                                                 | Jamaica . . . . .                                                                     | Turning, &c.                                                |
| 15. Cocus wood ( <i>Americum coccus</i> ).                                                                                   | Cuba . . . . .                                                                        | Cabinet-work and turning.                                   |
| 16. Coromandel or Calamander ( <i>Diogyros hisata</i> ).                                                                     | East Indies (Ceylon, Manila, &c.) . . . . .                                           | Turning.                                                    |
| 17. Ebony (black) ( <i>Diogyros melanoxylon</i> ).                                                                           | Africa, W. Coast . . . . .                                                            | Turning and cabinet-work.                                   |
| 18. Ebony (black) ( <i>Diogyros ebenus</i> ).                                                                                | Mauritius and Madagascar . . . . .                                                    | Dyeing and turning.                                         |
| 19. Fustic (green) ( <i>Ancurium sum chens</i> ).                                                                            | Bombay, &c., Sumatra, &c. . . . .                                                     | Dyeing.                                                     |
| 20. Fustic ( <i>Madrura tinctoria</i> ).                                                                                     | Jamaica and the Bahamas . . . . .                                                     | Hands, spikes, fishing-rods, &c.                            |
| 21. Hickory (billet) ( <i>Carya alba</i> ).                                                                                  | W. Indies (Cuba, also Savannah, Ionian Islands) . . . . .                             | Machinery and turning.                                      |
| 22. Ironwood ( <i>Sideroxylon</i> ).                                                                                         | The United States . . . . .                                                           | Cabinet-work and turning.                                   |
| 23. Jackwood ( <i>Artocarpus integrifolia</i> ).                                                                             | East Indies . . . . .                                                                 | Turning and cabinet-work.                                   |
| 24. Lignum vitae ( <i>Guaiacum officinale</i> ).                                                                             | The Brazils . . . . .                                                                 | Turning and cabinet-work.                                   |
| 25. Lignum vitae ( <i>Guaiacum officinale</i> ).                                                                             | West Indies (Cuba, also the Brazils) . . . . .                                        | Gig shafts, archery bows, &c.                               |
| 26. Lignum vitae ( <i>Guaiacum officinale</i> ).                                                                             | West Indies (St. Domingo, Jamaica, Porto Rico, Cuba, Honduras, the Bahamas) . . . . . | Turning and cabinet-work.                                   |
| 27. Lignum vitae ( <i>Guaiacum officinale</i> ).                                                                             | Australia . . . . .                                                                   | Turning.                                                    |
| 28. Lignum vitae ( <i>Guaiacum officinale</i> ).                                                                             | West Indies, also Central America, Madagascar . . . . .                               | Dyeing.                                                     |
| 29. Maple (bird's-eye and Rock) ( <i>Acer saccharinum</i> ).                                                                 | North America . . . . .                                                               | Turning and cabinet-work.                                   |
| 30. Maple (Russian) ( <i>Acer tataricum</i> ).                                                                               | Siberia, &c. . . . .                                                                  | Cabinet-work.                                               |
| 31. Maple (English) ( <i>Acer campestre</i> ).                                                                               | England . . . . .                                                                     | Cabinet-work.                                               |
| 32. Niacaragua wood ( <i>Cassipouia Hamingtonii</i> , &c.).                                                                  | Central America, &c. . . . .                                                          | Dyeing.                                                     |
| 33. Numeeg wood ( <i>Arceuthobium</i> ).                                                                                     | The Brazils (Para) . . . . .                                                          | Turning and cabinet-work, umbrellas and parasol sticks, &c. |
| 34. Palm-tree (black) ( <i>Cocos nipa</i> ).                                                                                 | East and West Indies . . . . .                                                        | Turning and cabinet-work, umbrellas and parasol sticks, &c. |
| 35. Palm-tree (prickly brown) ( <i>Cocos guianensis</i> ).                                                                   | The Brazils and West Indies . . . . .                                                 | Turning and cabinet-work, umbrellas and parasol sticks, &c. |
| 36. Partridge wood (brown and red) ( <i>Heisteria coccinea</i> ).                                                            | The Brazils and West Indies . . . . .                                                 | Turning and cabinet-work, umbrellas and parasol sticks, &c. |
| 37. Pheasant wood ( <i>Heisteria coccinea</i> ).                                                                             | West Indies (Jamaica) . . . . .                                                       | Turning and cabinet-work, umbrellas and parasol sticks, &c. |
| 38. Purple wood ( <i>Cordia Gecassantia</i> ).                                                                               | The Brazils and West Indies . . . . .                                                 | Dyeing and turning.                                         |
| 39. Purple wood ( <i>Cordia Gecassantia</i> ).                                                                               | The Brazils and West Indies . . . . .                                                 | Cabinet-work, turning, and brush-making.                    |
| 40. Quagga wood, or Jugosa wood ( <i>Laurus chlorostylus</i> ).                                                              | East Indies (Ceylon, &c.) . . . . .                                                   | Ship-building and furniture.                                |
| 41. Red sanders wood ( <i>Pterocarpus santalinus</i> ).                                                                      | The Brazils (Rio de Janeiro and Bahia) . . . . .                                      | Ship-building and furniture.                                |
| 42. Rosewood ( <i>Tropidoloma</i> ).                                                                                         | East Indies . . . . .                                                                 | Ship-building and furniture.                                |
| 43. Rosewood ( <i>Amyris balsamifera</i> ).                                                                                  | The Brazils (Rio de Janeiro and Bahia) . . . . .                                      | Ship-building and furniture.                                |
| 44. Rosewood ( <i>Dalbergia latifolia</i> ).                                                                                 | Honduras, &c. . . . .                                                                 | Ship-building and furniture.                                |
| 45. Rosetta wood . . . . .                                                                                                   | East Indies . . . . .                                                                 | Ship-building and furniture.                                |
| 46. Sabicu . . . . .                                                                                                         | Cuba . . . . .                                                                        | Ship-building and furniture.                                |
| 47. Sandalwood ( <i>Santalum album</i> ).                                                                                    | East Indies . . . . .                                                                 | Ship-building and furniture.                                |
| 48. Sapanwood ( <i>Cassipouia Seguinii</i> ).                                                                                | Honduras . . . . .                                                                    | Ship-building and furniture.                                |
| 49. Sapodilla ( <i>Fagara piperata</i> ).                                                                                    | East Indies . . . . .                                                                 | Ship-building and furniture.                                |
| 50. Satin wood . . . . .                                                                                                     | West Indies (St. Domingo, Porto Rico, &c.) . . . . .                                  | Ship-building and furniture.                                |
| 51. Tulip wood . . . . .                                                                                                     | The Brazils . . . . .                                                                 | Ship-building and furniture.                                |
| 52. Walnut wood ( <i>Juglans regia</i> ).                                                                                    | Italy and Belgium . . . . .                                                           | Ship-building and furniture.                                |
| 53. Yew tree ( <i>Taxus baccata</i> ).                                                                                       | England and Spain . . . . .                                                           | Ship-building and furniture.                                |
| 54. Zebra wood ( <i>Omphalobium Lambertii</i> ).                                                                             | The Brazils . . . . .                                                                 | Ship-building and furniture.                                |
| 55. An elephant's head, with tusks and grinders complete.                                                                    | Africa, W. Coast . . . . .                                                            | Ship-building and furniture.                                |
| 56. Elephants' tusks . . . . .                                                                                               | Africa — Cameroons, Angola, and The Cape . . . . .                                    | Ship-building and furniture.                                |
| 57. Elephants' tusks . . . . .                                                                                               | Calcutta, East Indies, and Alexandria . . . . .                                       | Ship-building and furniture.                                |
| 58. Elephants' grinders . . . . .                                                                                            | Africa . . . . .                                                                      | Ship-building and furniture.                                |
| 59. Sea-horse, or Hippopotamus teeth (curved and straight) . . . . .                                                         | East Indies and Africa . . . . .                                                      | Ship-building and furniture.                                |
| 60. Sea-cow, or walrus, teeth . . . . .                                                                                      | Hudson's Bay . . . . .                                                                | Ship-building and furniture.                                |
| 61. Mother-of-Pearl shells (white edge) . . . . .                                                                            | Singapore . . . . .                                                                   | Ship-building and furniture.                                |
| 62. Mother-of-Pearl shells (yellow) . . . . .                                                                                | Manilla . . . . .                                                                     | Ship-building and furniture.                                |
| 63. Mother-of-Pearl shells (black) . . . . .                                                                                 | Tahiti . . . . .                                                                      | Ship-building and furniture.                                |
| 64. Mother-of-Pearl shells (Bombay) . . . . .                                                                                | Bombay . . . . .                                                                      | Ship-building and furniture.                                |
| 65. Mother-of-Pearl shells (Buffalo) . . . . .                                                                               | S. America . . . . .                                                                  | Ship-building and furniture.                                |
| 66. Coquillo nuts ( <i>Attila funifera</i> ), a kind of palm tree, which yields the fibres now in use for coarse brooms, &c. | Brazils . . . . .                                                                     | Ship-building and furniture.                                |
| 67. Corozo, or Coruseo nuts ( <i>Phytolophus macrocarpa</i> ).                                                               | Colombia . . . . .                                                                    | Ship-building and furniture.                                |

Also, IN THE NAVE, WEST OF THE TRANSEPT,  
A solid circular slab of Honduras Mahogany, 7 feet 6 inches in diameter.





**GREAT EXHIBITION**  
**Of the Works of Industry of all Nations.**

**Class 4, No. 115.**

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**INDIA RUBBER** Water Repellent Clothing of Silk and Cotton Fabrics, viz.,

DRAB SILK LADIES' POLKAS, weight 9 oz.

DRAB AND BLACK SILK GENTLEMEN'S WRAPPERS, weight 11 to 13 oz.

**PATENT MINERALIZED RUBBER** Gentlemen's Wrappers, Black and Drab, weight 11 to 16 oz.

Not affected by Heat, Cold, or Grease.

ZEPHYR WRAPPERS, LEGGINGS, GUN COVERS.

SEAMEN'S COATS AND JACKETS, TROUSERS AND OVERALLS.

SOU-WESTERS AND THRASHERS.

**AIR-CUSHIONS OF ALL DESCRIPTIONS, PILLOWS, BEDS, AND**

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INDIA RUBBER Brace, Garter, Stay, Boot, Sandal, and Glove WEBS, of all descriptions.

**BRAIDED AND SPIRAL ELASTIC SQUARE AND ROUND CORDS.**

MOHAIR, ALPACA, GENAPPE, WORSTED, AND SILK Braids, of all kinds.

**SILK AND MOHAIR COAT, WAISTCOAT, AND OTHER CORDS.**

**COTTON SKIRT CORDS.**

MILITARY BRAIDS, of all widths, from half an inch upwards.

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BOTTLE THREAD, AND Patent Mineralized Thread.

**PATENT MINERALIZED RUBBER**, available for Engineering purposes, Free from Sulphur,

AND WHICH, NOT AFFECTED BY HEAT, COLD, OR GREASE, WILL NOT BECOME HARD,

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Importers of GUTTA PERCHA.

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INDIA RUBBER THREAD, SOLUTION, STATIONERS' & SHEET RUBBER.

Manufacturers of Gutta Percha Sheet, Soles Solution, etc. etc.

(Burke's Patent Water Repellent) or SINGLE TEXTURE.

|                                        | Length. | Zephyr. | Swans-down. | Tweed, Llama, & Mineralised India Cloth. | Moleskin. | Silk. | Oriental (Drab) Silk. |
|----------------------------------------|---------|---------|-------------|------------------------------------------|-----------|-------|-----------------------|
| Capes.                                 | 24      | 11      | 11 6        | 17                                       | ...       | 21    | 25                    |
|                                        | 27      | 11 6    | 12 6        | 18 6                                     | ...       | 24    | 28                    |
|                                        | 30      | 12      | 13 6        | 21                                       | ...       | 28 6  | 32                    |
|                                        | 33      | 13      | 15          | 23                                       | ...       | 32    | 36                    |
|                                        | 36      | 14 6    | 16          | 25                                       | ...       | 36 6  | 40                    |
|                                        | 40      | 17      | 17 6        | 27                                       | ...       | 40    | 44                    |
|                                        | 42      | 18      | 18 6        | 28 6                                     | ...       | ...   | ...                   |
| Circular Capes, with Short Sleeves.    | 44      | 19      | 19 6        | 30                                       | ...       | ...   | ...                   |
|                                        | 46      | 20 6    | 21 6        | 32                                       | ...       | ...   | ...                   |
|                                        | 33      | 19 6    | 22 6        | 30                                       | 28        | 36    | 39                    |
|                                        | 36      | 20 6    | 23 6        | 32                                       | 30        | 39    | 41                    |
|                                        | 40      | 22 6    | 24 6        | 34                                       | 32        | 42    | 44 6                  |
|                                        | 42      | 24      | 25 6        | 37                                       | 35        | 43 6  | 48                    |
|                                        | 44      | 25      | 26 6        | 40                                       | 38        | 45 6  | 52 6                  |
| Capes, with Sleeves, or Chesterfields. | 46      | 26 6    | 28          | 43                                       | 40        | 48 6  | 55                    |
|                                        | 48      | 28      | 29 6        | 45                                       | 42        | 51 6  | 57 6                  |
|                                        | 50      | 30 6    | 33 6        | 48                                       | 46        | 54 6  | 60                    |
|                                        | 36      | 19      | 22          | 29                                       | 27        | 34    | 37                    |
|                                        | 38      | 20      | 23          | 31                                       | 29        | 36 6  | 40                    |
|                                        | 40      | 22      | 24          | 33                                       | 31        | 39 6  | 43 6                  |
|                                        | 42      | 23 6    | 25          | 36                                       | 34        | 42    | 47                    |
| Wrappers, or Loose Coats.              | 44      | 24      | 26          | 38 6                                     | 36 6      | 44 6  | 50                    |
|                                        | 46      | 25 6    | 27 6        | 40                                       | 38        | 47    | 53                    |
|                                        | 48      | 27      | 29          | 42 6                                     | 40        | 49 6  | 57                    |
|                                        | 50      | 30      | 32 6        | 45                                       | 42        | 52 6  | 59                    |
|                                        | 36      | 16 3    | 19 6        | 26                                       | 24        | 32    | 36                    |
|                                        | 38      | 17      | 20 6        | 27                                       | 25        | 34    | 38                    |
|                                        | 40      | 18      | 21          | 28                                       | 26        | 36    | 40                    |
| Yacht Jackets.                         | 42      | 18 6    | 21 6        | 29                                       | 27        | 38    | 42 6 6                |
|                                        | 44      | 19      | 22          | 30                                       | 28        | 40    | 45                    |
|                                        | 46      | 19 6    | 23          | 31                                       | 29        | 42    | 47                    |
|                                        | 48      | 20      | 24          | 32                                       | 30        | 44    | 50                    |
|                                        | 50      | 22      | 25 6        | 35                                       | 32        | 46    | 53                    |
|                                        | ...     | 17 6    | 18 6        | ...                                      | ...       | ...   | ...                   |
|                                        | ...     | 12      | 12 6        | ...                                      | ...       | ...   | ...                   |
| Trousers                               | ...     | 6       | 7           | ...                                      | 9         | ...   | ...                   |
|                                        | ...     | ...     | ...         | ...                                      | ...       | ...   | ...                   |
| Leggings.                              | ...     | ...     | ...         | ...                                      | ...       | ...   | ...                   |
|                                        | ...     | ...     | ...         | ...                                      | ...       | ...   | ...                   |

Piece Goods.

|                                                | No.     | s.     | d.      |
|------------------------------------------------|---------|--------|---------|
| Sou'-Westers                                   | 1-22    | 61     | 7       |
| "                                              | 2-30    | 60     | 6 6     |
| "                                              | 1-22    | 52     | 8       |
| "                                              | 2-30    | 52     | 9       |
| Railway Wrappers, and Chaise Aprons. Flushing. | 1½-12 6 | 52     | 9       |
| "                                              | 1½-16 6 | 54     | 7 6     |
| "                                              | 1½-22 6 | 54     | 7 6     |
| Ditto. Tartan Blanketing.                      | 1½-20   | 60     | 16      |
| "                                              | 1½-27   | from 5 | ...     |
| Ditto. Beaverteen, lined.                      | 1½-27   | from 5 | ...     |
| Zephyr                                         | 60 in.  | 6      | per yd. |
| Swansdown                                      | 61      | 7      | "       |
| Twill Cambric                                  | 60      | 6 6    | "       |
| Tweed                                          | 52      | 8      | "       |
| Sheeting, or Seamen's Cloth                    | 60      | 5 6    | "       |
| India Cloth                                    | 52      | 9      | "       |
| Oriental ditto                                 | 10      | 6      | "       |
| Alpaca                                         | 54      | 7 6    | "       |
| Moleskin                                       | 54      | 7 6    | "       |
| Silk                                           | 60      | 16     | "       |
| Canvas                                         | from 5  | ...    | "       |

as Wrappers, 36 in. to 50 in., 15s. to 22s.

|                                | Extras.    |
|--------------------------------|------------|
| Cambric                        | 5/6 extra. |
| Stout Twill, Fustian or Canton | 2s. extra. |
| Zephyr                         | 2s. extra. |
| Persian or Camlet              | 2s. extra. |
| Super Llama                    | 2s. extra. |
| Cambric                        | 2s. extra. |
| Stout Twill, Fustian or Canton | 2s. extra. |
| Zephyr                         | 2s. extra. |
| Persian or Camlet              | 2s. extra. |
| Super Llama                    | 2s. extra. |

DOUBLE TEXTURE (Commonly called Mackintosh.)

|                                           | INCHES LONG.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capes.                                    | 27 31 34 36 38 40 42 44 46 48 50                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Grey Sheeting or Cambric                  | 7 10 6 11 6 12 6 13 6 14 6 15 6 16 6 17 6 18 6 19 6 20 6 21 6 22 6 23 6 24 6 25 6 26 6 27 6 28 6 29 6 30 6 31 6 32 6 33 6 34 6 35 6 36 6 37 6 38 6 39 6 40 6 41 6 42 6 43 6 44 6 45 6 46 6 47 6 48 6 49 6 50 6 51 6 52 6 53 6 54 6 55 6 56 6 57 6 58 6 59 6 60 6 61 6 62 6 63 6 64 6 65 6 66 6 67 6 68 6 69 6 70 6 71 6 72 6 73 6 74 6 75 6 76 6 77 6 78 6 79 6 80 6 81 6 82 6 83 6 84 6 85 6 86 6 87 6 88 6 89 6 90 6 91 6 92 6 93 6 94 6 95 6 96 6 97 6 98 6 99 6 100 6 |
| Stout Twill or Zephyr                     | 11 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                  |
| Stuff                                     | 10 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                               |
| Persian or Camlet                         | 14 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                           |
| Super Llama                               | 18 6 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                                     |
| Wrappers or Loose Coats.                  | 34 36 38 40 42 44 46 48 50 52                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| *Grey Sheeting or Cambric                 | 15 3 15 9 16 6 17 3 18 0 19 6 20 3 21 0 22 6 23 3 24 0 25 6 26 3 27 0 28 6 29 3 30 0 31 6 32 3 33 0 34 6 35 3 36 0 37 6 38 3 39 0 40 6 41 3 42 0 43 6 44 3 45 0 46 6 47 3 48 0 49 6 50 3 51 0 52 6 53 3 54 0 55 6 56 3 57 0 58 6 59 3 60 0 61 6 62 3 63 0 64 6 65 3 66 0 67 6 68 3 69 0 70 6 71 3 72 0 73 6 74 3 75 0 76 6 77 3 78 0 79 6 80 3 81 0 82 6 83 3 84 0 85 6 86 3 87 0 88 6 89 3 90 0 91 6 92 3 93 0 94 6 95 3 96 0 97 6 98 3 99 0 100 6                       |
| *Stout Twill, Fustian or Canton           | 17 9 18 6 19 3 20 0 21 6 22 3 23 0 24 6 25 3 26 0 27 6 28 3 29 0 30 6 31 3 32 0 33 6 34 3 35 0 36 6 37 3 38 0 39 6 40 3 41 0 42 6 43 3 44 0 45 6 46 3 47 0 48 6 49 3 50 0 51 6 52 3 53 0 54 6 55 3 56 0 57 6 58 3 59 0 60 6 61 3 62 0 63 6 64 3 65 0 66 6 67 3 68 0 69 6 70 3 71 0 72 6 73 3 74 0 75 6 76 3 77 0 78 6 79 3 80 0 81 6 82 3 83 0 84 6 85 3 86 0 87 6 88 3 89 0 90 6 91 3 92 0 93 6 94 3 95 0 96 6 97 3 98 0 99 6 100 3                                      |
| Zephyr                                    | 17 9 18 6 19 3 20 0 21 6 22 3 23 0 24 6 25 3 26 0 27 6 28 3 29 0 30 6 31 3 32 0 33 6 34 3 35 0 36 6 37 3 38 0 39 6 40 3 41 0 42 6 43 3 44 0 45 6 46 3 47 0 48 6 49 3 50 0 51 6 52 3 53 0 54 6 55 3 56 0 57 6 58 3 59 0 60 6 61 3 62 0 63 6 64 3 65 0 66 6 67 3 68 0 69 6 70 3 71 0 72 6 73 3 74 0 75 6 76 3 77 0 78 6 79 3 80 0 81 6 82 3 83 0 84 6 85 3 86 0 87 6 88 3 89 0 90 6 91 3 92 0 93 6 94 3 95 0 96 6 97 3 98 0 99 6 100 3                                      |
| Stuff                                     | 17 9 18 6 19 3 20 0 21 6 22 3 23 0 24 6 25 3 26 0 27 6 28 3 29 0 30 6 31 3 32 0 33 6 34 3 35 0 36 6 37 3 38 0 39 6 40 3 41 0 42 6 43 3 44 0 45 6 46 3 47 0 48 6 49 3 50 0 51 6 52 3 53 0 54 6 55 3 56 0 57 6 58 3 59 0 60 6 61 3 62 0 63 6 64 3 65 0 66 6 67 3 68 0 69 6 70 3 71 0 72 6 73 3 74 0 75 6 76 3 77 0 78 6 79 3 80 0 81 6 82 3 83 0 84 6 85 3 86 0 87 6 88 3 89 0 90 6 91 3 92 0 93 6 94 3 95 0 96 6 97 3 98 0 99 6 100 3                                      |
| Persian or Camlet                         | 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                                       |
| Super Llama                               | 22 6 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                                           |
| * Principally for Carters.                | † Principally for Coachmen.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Circular Capes, with Sleeves, for Riding. | 34 36 38 40 42 44 46 48 50 52                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Cambric                                   | 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                              |
| Stout Twill or Zephyr                     | 19 6 20 6 21 6 22 6 23 6 24 6 25 6 26 6 27 6 28 6 29 6 30 6 31 6 32 6 33 6 34 6 35 6 36 6 37 6 38 6 39 6 40 6 41 6 42 6 43 6 44 6 45 6 46 6 47 6 48 6 49 6 50 6 51 6 52 6 53 6 54 6 55 6 56 6 57 6 58 6 59 6 60 6 61 6 62 6 63 6 64 6 65 6 66 6 67 6 68 6 69 6 70 6 71 6 72 6 73 6 74 6 75 6 76 6 77 6 78 6 79 6 80 6 81 6 82 6 83 6 84 6 85 6 86 6 87 6 88 6 89 6 90 6 91 6 92 6 93 6 94 6 95 6 96 6 97 6 98 6 99 6 100 6                                                |
| Stuff                                     | 19 6 20 6 21 6 22 6 23 6 24 6 25 6 26 6 27 6 28 6 29 6 30 6 31 6 32 6 33 6 34 6 35 6 36 6 37 6 38 6 39 6 40 6 41 6 42 6 43 6 44 6 45 6 46 6 47 6 48 6 49 6 50 6 51 6 52 6 53 6 54 6 55 6 56 6 57 6 58 6 59 6 60 6 61 6 62 6 63 6 64 6 65 6 66 6 67 6 68 6 69 6 70 6 71 6 72 6 73 6 74 6 75 6 76 6 77 6 78 6 79 6 80 6 81 6 82 6 83 6 84 6 85 6 86 6 87 6 88 6 89 6 90 6 91 6 92 6 93 6 94 6 95 6 96 6 97 6 98 6 99 6 100 6                                                |
| Persian or Camlet                         | 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                                          |
| Super Llama                               | 27 6 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                                                          |
| Capes, with Sleeves, or Chesterfields.    | 34 36 38 40 42 44 46 48 50 52                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Cambric                                   | 18 18 9 19 6 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                          |
| Stout Twill, Fustian or Canton            | 21 3 22 6 23 3 24 6 25 3 26 6 27 3 28 6 29 3 30 6 31 3 32 6 33 3 34 6 35 3 36 6 37 3 38 6 39 3 40 6 41 3 42 6 43 3 44 6 45 3 46 6 47 3 48 6 49 3 50 6 51 3 52 6 53 3 54 6 55 3 56 6 57 3 58 6 59 3 60 6 61 3 62 6 63 3 64 6 65 3 66 6 67 3 68 6 69 3 70 6 71 3 72 6 73 3 74 6 75 3 76 6 77 3 78 6 79 3 80 6 81 3 82 6 83 3 84 6 85 3 86 6 87 3 88 6 89 3 90 6 91 3 92 6 93 3 94 6 95 3 96 6 97 3 98 6 99 3 100 6                                                          |
| Zephyr                                    | 21 3 22 6 23 3 24 6 25 3 26 6 27 3 28 6 29 3 30 6 31 3 32 6 33 3 34 6 35 3 36 6 37 3 38 6 39 3 40 6 41 3 42 6 43 3 44 6 45 3 46 6 47 3 48 6 49 3 50 6 51 3 52 6 53 3 54 6 55 3 56 6 57 3 58 6 59 3 60 6 61 3 62 6 63 3 64 6 65 3 66 6 67 3 68 6 69 3 70 6 71 3 72 6 73 3 74 6 75 3 76 6 77 3 78 6 79 3 80 6 81 3 82 6 83 3 84 6 85 3 86 6 87 3 88 6 89 3 90 6 91 3 92 6 93 3 94 6 95 3 96 6 97 3 98 6 99 3 100 6                                                          |
| Stuff                                     | 20 6 21 6 22 6 23 6 24 6 25 6 26 6 27 6 28 6 29 6 30 6 31 6 32 6 33 6 34 6 35 6 36 6 37 6 38 6 39 6 40 6 41 6 42 6 43 6 44 6 45 6 46 6 47 6 48 6 49 6 50 6 51 6 52 6 53 6 54 6 55 6 56 6 57 6 58 6 59 6 60 6 61 6 62 6 63 6 64 6 65 6 66 6 67 6 68 6 69 6 70 6 71 6 72 6 73 6 74 6 75 6 76 6 77 6 78 6 79 6 80 6 81 6 82 6 83 6 84 6 85 6 86 6 87 6 88 6 89 6 90 6 91 6 92 6 93 6 94 6 95 6 96 6 97 6 98 6 99 6 100 6                                                     |
| Persian or Camlet                         | 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100                                                                                                                                                                                                                             |
| Super Llama                               | 25 6 27 3 28 6 29 3 30 6 31 3 32 6 33 3 34 6 35 3 36 6 37 3 38 6 39 3 40 6 41 3 42 6 43 3 44 6 45 3 46 6 47 3 48 6 49 3 50 6 51 3 52 6 53 3 54 6 55 3 56 6 57 3 58 6 59 3 60 6 61 3 62 6 63 3 64 6 65 3 66 6 67 3 68 6 69 3 70 6 71 3 72 6 73 3 74 6 75 3 76 6 77                                                                                                                                                                                                         |



509



# EXPOSITION UNIVERSELLE DE LONDRES.

## RÉCOMPENSES NATIONALES.

1825,  
MÉDAILLE D'ARGENT  
ET  
MÉDAILLE D'OR.

1827,  
MÉDAILLE  
DÉCERNÉE PAR LE ROI,  
ET

MÉDAILLE D'OR.

1829,  
MÉDAILLE D'OR  
ET

**PRIX DE 2,000 FRANCS**  
remporté au Concours général, à Paris,  
pour la fabrication de la Colle forte et  
de la Gélatine.

1834,  
NOUVELLE MÉDAILLE  
DÉCERNÉE PAR LE ROI.

Les nombreuses Récompenses Nationales obtenues par M. GRENET depuis vingt-cinq ans, les rapports favorables qui ont été faits en France sur ses produits par les Savants les plus distingués, et aux Consommateurs, c'est que M. GRENET fabrique une espèce de Gélatine blanche dont la supériorité est généralement reconnue, parce qu'elle ne contient ni sels, ni acides. M. GRENET, qui en est l'inventeur, l'a nommée *Grenetine*; cette Gélatine n'est pas extraite des os. Les Gélatines que l'on obtient ordinairement des os à l'aide de l'acide muriatique ne peuvent pas convenir pour les préparations alimentaires et pharmaceutiques; il est même souvent très dangereux de les employer. La colle de poisson est préférable, mais la Gélatine de M. GRENET est bien supérieure à la colle de poisson, parce qu'elle est d'une pureté parfaite, n'a aucun goût et se dissout très facilement sans laisser de résidu sensible, tandis que la colle de poisson est difficile à fondre, laisse toujours un goût désagréable, produit beaucoup de déchet et ne se conserve pas aussi longtemps en gelée. En outre, la Gélatine de M. GRENET présente aux Consommateurs une grande économie, puisque la colle de poisson de bonne qualité se vend au moins 3,000 fr. les 100 kilos, tandis que le prix de la Gélatine première qualité de M. GRENET, n'est que de 1,000 fr.

## MANUFACTURE

## GARNET, A ROUEN.

INVENTEUR DE LA GÉLATINE DITE GRENETINE, SUPÉRIEURE A LA COLLE DE POISSON

(Economie de plus de cent pour cent.)

## COLLES ET GÉLATINES DE TOUTES ESPÈCES.

**Fabrication de Papier-Gélatine de toutes couleurs,  
pour lithographie, fleurs artificielles, pains à cacheter, cartes d'adresses  
et de visites en gélatine, etc., etc.**

RÉCOMPENSES NATIONALES.  
1839,  
MÉDAILLE D'HONNEUR  
ET RAPPEL DE  
MÉDAILLE D'ARGENT.

1844,  
NOUVEAU CONCOURS  
A PARIS,  
Pour la fabrication de la Colle forte  
et de la Gélatine.

PRIX : MÉDAILLE D'OR

ET  
MÉDAILLE UNIQUE  
(supériorité.)

1849,  
EXPOSITION GÉNÉRALE  
DES PRODUITS DE L'INDUSTRIE FRANÇAISE.  
NOUVELLE MÉDAILLE D'OR.

1850,

INSTITUT DES PROVINCES.  
MÉDAILLE DE SUPÉRIORITÉ.

## RAPPORTS des Sociétés savantes sur la Gélatine de M. GRENET.

### SOCIÉTÉ D'ENCOURAGEMENT DE PARIS POUR L'INDUSTRIE NATIONALE.

**CONCOURS pour la fabrication de la Colle-forte et de la Gélatine; 1825.**

*EXTRAITS des Rapports faits par M. Payen, au nom du Comité des Arts chimiques, composé de MM. le baron Thenard, D'Arcet, Gay-Lussac, Dumas, Mérinée, Gautier de Claubry, Bréant, Robiquet, Roard, Pelletier, Boullay, Bussy et Payen, rapporteur.*

SEANCE GÉNÉRALE DU 26 OCTOBRE 1825,

PRÉSIDÉE PAR M. LE COMTE CHAPTAL, PAIR DE FRANCE.

La gélatine de M. Grenet est incolore, sans goût ni saveur sensible, tandis que la colle de poisson laisse toujours un léger goût. Cette gélatine est donc plus propre que la colle de poisson pour préparer les gélées alimentaires; elle ne donne aucun signe d'acidité. Cette colle-forte est très convenable dans la préparation des fleurs artificielles. Les apprêteurs de gaze pourraient l'employer avantageusement lors même qu'elle serait moins blanche et moins transparente. Elle réussit bien dans les préparations pharmaceutiques, dans la fabrication du taffetas d'Angleterre, du cartonage fin, du papier glace, etc.

Une MÉDAILLE D'OR est décernée à M. Grenet.

Signé : PAYEN, rapporteur.

### SEANCE générale du 28 Novembre 1827.

Deux disques en fer, offrant une surface de soixante millimètres, doucis à la pierre ponce et réunis avec une solution de dix grammes de colle de M. Grenet, ont nécessité, pour être séparés, après vingt-quatre heures, un poids de deux cent vingt kilogrammes.

Un RAPPEL DE MÉDAILLE D'OR est accordé à M. Grenet.

Signé : PAYEN, rapporteur.

### ACADÉMIE ROYALE DE MÉDECINE,

Assemblée générale, séance du 3 Juin 1828.

Vous avez chargé MM. le baron Larrey, Henry père, Pariset et moi de vous faire un rapport sur un échantillon de gélatine, présenté par M. Grenet, fabricant à Rouen. Je vais avoir l'honneur de remplir cette tâche au nom de votre commission.

M. Grenet peut être compté parmi ces heureux fabricants qui ne craignent point de rivaux. Nous ne pourrions mieux le prouver qu'en vous citant les distinctions dont il a été l'objet. La Société d'Encouragement pour l'industrie nationale lui a décerné, en 1825, UNE MÉDAILLE D'OR. En 1827, elle lui a accordé le rappel de cette médaille; à la dernière exposition des produits de l'industrie, M. Grenet a reçu une nouvelle médaille. La gélatine de M. Grenet offre toutes les qualités que les praticiens doivent rechercher dans cette substance; sa blancheur, sa transparence, son insipidité, l'absence de toute odeur, sa solubilité complète, sont autant de preuves d'une pureté parfaite. Ajoutons que cette gélatine n'offre aucun caractère d'acidité ni d'alcalinité, et qu'elle brûle sans résidu sensible; dans cet état, elle peut prendre toutes les formes, toutes les saveurs, toutes les odeurs; on peut avec elle rendre consistantes et nourrissantes presque toutes les liqueurs, boissons, solutions, dont le goût et l'état des malades réclamaient l'administration.

Signé : Baron LARREY, HENRY Père, E. PARISET  
et ROBINET, rapporteur.

### CONCOURS GÉNÉRAL

POUR LA FABRICATION DE LA COLLE-FORTE ET DE LA GÉLATINE,  
**Prix de 2,000 Francs, proposé par la Société d'Encouragement pour l'Industrie Nationale, à Paris.**

SEANCE DU 16 DÉCEMBRE 1829, présidée par M. CHAPTAL, Pair de France.  
Nous avons reconnu que les divers échantillons de colle ou gélatine, présentés par M. Grenet, étaient parfaitement appropriés aux différents usages

auxquels ils sont destinés, et que la variété n° 7 (dite grenetine), en feuillets minces, diaphanes, presque incolores, offrait une qualité supérieure à tous les autres produits du même genre des fabriques établies en France et même en Europe.

LE PRIX EST REMPORTÉ PAR M. GRENET.

Signé : PAYEN, rapporteur.

### ACADÉMIE DE L'INDUSTRIE AGRICOLE ET MANUFACTURIÈRE DE PARIS.

Séance publique annuelle du 21 Juillet 1839, présidée par M. le duc DE MONTMORENCY, Pair de France.

L'Académie reconnaissant la supériorité des produits gélatineux de M. Grenet, de Rouen, lui décerne une MÉDAILLE D'HONNEUR EN PLATINE.  
Signé : Duc de MONTMORENCY, Pair de France.

### NOUVEAU CONCOURS A PARIS

POUR LA FABRICATION DE LA COLLE-FORTE ET DE LA GÉLATINE.

Prix proposé par la Société d'Encouragement de Paris, pour l'Industrie Nationale.

SEANCE du 29 Mai 1844, présidée par M. DUMAS, Membre de l'Institut.

Au premier rang, nous placerons, cette fois encore, M. Grenet, de Rouen, dont les produits, supérieurs en qualité à tout ce que l'on fabrique en Europe dans ce genre, sont aujourd'hui préparés en quantités considérables. Les gélatines blanches, transparentes et pures de M. Grenet, trouvent de plus importantes et de nouvelles applications dans la préparation des pains à cacheter diaphanes ornés de figures en reliefs, colorées; dans la confection de jolies fleurs artificielles; elles tiennent toujours le premier rang pour les apprêts des tissus fins et blancs ou de nuances délicates, et sont sans rivaux dans les applications aux gélées qui décorent les desserts de nos tables. La fabrication des belles gélatines et des colles-fortes commerciales paraissant être arrivée à son apogée chez M. Grenet, de Rouen, le Conseil d'Administration lui a décerné le prix : MÉDAILLE D'OR DE PREMIÈRE CLASSE.

Signé : PAYEN, rapporteur.

### EXPOSITION DES PRODUITS DE L'INDUSTRIE FRANÇAISE,

M. GRENET occupe toujours le premier rang parmi les meilleurs fabricants de gélatine.

Ses produits, blancs ou colorés de diverses nuances, diaphanes, brillants, sont insolubles dans l'eau froide, et peuvent se gonfler dans ce liquide au point de quintupler de volume.

Entièrement solubles dans l'eau bouillante, ils ne développent aucune désagréable odeur; on peut donc les aromatiser à l'aide de diverses essences ou liqueurs alcooliques, les édulcorer avec du sucre et des jus de fruits, et en composer des gélées et différentes préparations comestibles.

Les gélatines et colles-fortes des 2<sup>e</sup>, 3<sup>e</sup> et 4<sup>e</sup> qualités offrent les caractères des produits non altérés, et s'appliquent avec succès aux apprêts et aux divers usages des colles très adhésives.

Les gélatines en larges feuilles transparentes, incolores et minces, constituent un très beau papier glace.

Les gélatines en feuilles teintes, découpées sous différentes formes, reçoivent la dorure, les impressions, et sont livrées par M. Grenet sous les formes variées de cachets, cartes de visite, étiquettes décorées, et adresses. Elles s'appliquent à la confection des fleurs artificielles et de divers autres objets de luxe. En aucun pays que nous sachions, on atteint le degré de perfection auquel M. Grenet est parvenu.

Cet habile manufacturier, en améliorant encore et en variant ses produits depuis l'exposition dernière, acquiert cette année de nouveaux titres aux récompenses nationales.

Le Jury lui décerne UNE MÉDAILLE D'OR.

Signé : PAYEN, rapporteur.

Nota. — M. GRENET est représenté à l'Exposition par M. F. MULLER, Providence house, East street Cambridge heat London.



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Our English patent was taken out in the name of our partner **W. THOMAS D. ROTCH** of N<sup>o</sup> 2  
Furnival's Inn London, to whom all Communications may be adressed.

**EXPOSITION**

**DE LONDRES**

**BOUGIES  
CANDLES**

**MANUFACTURE  
DE  
JAILLON MOINIER & C<sup>IE</sup>  
A  
LA VILLETTE PRÈS PARIS.**

**SAVONS  
SOAPS**

By means of their inventions,  
patented in France and in foreign countries, Messrs.  
Jaillon Moinier & C<sup>ie</sup> have solved an important problem.  
They manufacture Stearic Candles remarkable for their  
transparency, whiteness, durability, and purity of flame,  
but above all for the lowness of price, which has been reduced  
so as to allow all classes to be able to purchase the candles.  
Their soaps reunite all the essential qualities sought  
by purchasers; absence of all sorts of odours,  
hardness, tenacity, and a great  
economy.

A l'aide de leurs procédés brevetés en France et à  
l'étranger, MM. JAILLON MOINIER & C<sup>ie</sup> ont résolu un problème  
important. Ils fabriquent des Bougies Stéariques qui se di-  
stinguent par leur transparence, leur blancheur, leur durée, la  
pureté de la lumière et surtout par le prix singulièrement réduit,  
qui en rend l'usage économique et à la portée de toutes les classes.  
Leurs Savons réunissent toutes les qualités essentielles, que  
recherchent les consommateurs: l'absence de toute  
odeur, la dureté, la tenacité & une grande  
économie.

Par suite de leurs inventions  
brevetées en France et à l'étranger, Messrs.  
Jaillon Moinier & C<sup>ie</sup> ont résolu un problème  
important. Ils fabriquent des Bougies Stéariques qui se di-  
stinguent par leur transparence, leur blancheur, leur durée, la  
pureté de la lumière et surtout par le prix singulièrement réduit,  
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Leurs Savons réunissent toutes les qualités essentielles, que  
recherchent les consommateurs: l'absence de toute  
odeur, la dureté, la tenacité & une grande  
économie.

Représentés à l'Exposition par **M. ROUGET DE LISLE**, Ingénieur civil, 167, Regent Street. London.

Eight various specimens are now exhibited in  
Class 4, No. 63, of the Great Exhibition.

Price:—White Varnish £2. 2s. per Gallon; Brown ditto 30s. per Gallon;  
to be obtained, in any quantities, solely of the Manufacturer.







PATRONIZED BY HER MAJESTY.

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JAMES MANNING,

WHITE AND BROWN

SPIRIT VARNISH

MANUFACTURER,

18, *Coles Terrace, Barnsbury Road,*  
ISLINGTON.

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This Varnish, *which is made by an entirely cold process,* is particularly adapted for Drawings and Prints of all descriptions, when properly prepared, as, owing to its smooth surface and clearness, it only requires laying on with a brush.—“No POLISHING NEEDED.”

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Eight various Specimens are now exhibited in  
Class 4, No. 63, of the Great Exhibition.

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Price:—White Varnish £2. 2s. per Gallon; Brown ditto 30s. per Gallon;  
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